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ABSTRACT

The 11 papers in this collection focus on research in instructional television, the theme of a conference attended by media producers, researchers, and policy makers from Australia, Britain, Canada, France, West Germany, the Netherlands, South Africa, and the United States. The opening paper by Deane Hutton discusses two parallel but contrasting developments in educational television in Australia and indicates the role that future research may take in the development of television production. Subsequent papers by James Paluzzi and Erhard Heidt view the state of the art in television research from production and theoretical standpoints respectively. Other papers by Dolf Zillmann, Nikos Metallinos, and Claudette Davis discuss experimental investigations or particular television production techniques such as humor and camera angle, and Gary Coldevin reviews the wide range of practical guidelines now emerging from such research. In the remaining papers, Keith Mielke and Milton Chen describe the research and development of a major new educational series by the Children's Television Workshop in New York, and Charles Callanan and Joan Kaller discuss pioneering ideas in stereophonic television and community narrow-casting. A list of conference participants is included. (Author/LMM)

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PROCEEDINGS OF THE
Third International Conference
On
Experimental Research in Televised Instruction

Edited by

JON BAGGALEY

Memorial University of Newfoundland
August 25-27, 1980

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INTRODUCTION

Memorial University's two previous Conferences on educational TV research had captured international interest and focused attention in several new research directions. Started in 1979 by Arthur Sullivan and the MUN Extension Service, the Conference series now continues into its third year with the publication of the following Proceedings relating to the 1980 meeting. This Conference concentrated on one particular theme - experimental research in TV production - recommended by those present at the earlier meetings. The theme was addressed by speakers from Canada, U.S.A., Australia, Britain and West Germany; and the Conference attracted a record attendance of 70 TV producers and researchers from these five countries - also from France, the Netherlands, and South Africa.

The focus on educational television was expanded on this occasion to include research in the production of TV news and current affairs - instructional television in the broadest sense. The opening paper by Deane Hutton clearly indicates the role that research may take in the development of TV production technique henceforward: it should serve to inform TV producers of the extent to which their tacit (intuitive) understanding of television's impact is actually correct. Subsequent papers by Paluzzi and Heidt view the state of the art in TV research from production and theoretical standpoints respectively. In papers by Zillmann, Metallinos, and Davis, experimental investigations of particular aspects of TV production are discussed; while the wide range of guidelines now emerging from such research is reviewed by Coldevin.

The research and development of a major new educational series by the Children's TV Workshop is next discussed by Mielke and Chen, while papers by Kaller and Callanan describe pioneering ideas in stereophonic TV and community narrow-casting. Also presented to the Conference were demonstrations of the Program Evaluation Analysis Computer by George Spears of TV Ontario (see Vol. 11 of this series), and of the Telidon videotext system by Herb Bown of the Government Communications Research Centre, Ottawa. In addition, Fred Hollingshurst discussed the public broadcasting work of Memorial University's ETV Service, and Jon Baggaley updated the report of his research into TV production techniques included in Volume 1 of this series.

For research into TV production to have any real significance, it must of course have ready practical applicability. Only the TV producer, therefore, can ultimately assess the value of particular research ideas and findings. For this reason three pannelists from different areas of TV production undertook to review the Conference - an invidious task for which Don Ferguson, Sabine Jorg and Gar Fizzard deserve our thanks.

The Conference Organizers - Faculty and Staff of the MUN Institute for Research in Human Abilities - also wish to thank their colleagues in the University's Extension Services, Extension Media Unit, CAVE, ETV, Coughlan College, Adminisrative Services, Student Housing (catering), University Relations and the Comptroller's Office for their help in organizing the Conference: also those members of the Newfoundland Department of Tourism, Parks Canada, Arts and Culture Centre, Avalon Cablevision, Canadian Imperial Bank of Commerce, Bank of Montreal, St. Clare's Mercy Hospital and the Knights of Columbus, who provided assistance and materials. To Dr. Fred Aldrich, MUN Dean of Graduate Studies, we are grateful for his welcoming address at the Conference opening;

and we extend warm thanks to Dr. Harry Jamieson for convening the successful TV Production Workshop which followed the main Conference. In particular we acknowledge the generous financial support given to the Conference by the Social Science & Humanities Research Council of Canada.

My personal thanks as Conference convenor go to our ever friendly and helpful Conference staff - Gerri Barbour, Bill Campbell, Mike Dawson, Margaret Delaney, Gary Hollett, Mary Lawlor, Don Murphy, Paul Noseworthy, Ada O'Reilly, Joan Sharpe, and Gary Smythe. Their work was invaluable in making the Third Conference as exceptionally happy and valuable as its two forerunners. To Joan Sharpe I am particularly grateful for her patient work on this manuscript: I thank Patricia McGrath and Sherry Lester of Extension Service for typing it, and Stewart Moss of ETV for his valuable help with the graphics.

It is certainly to be hoped that the good work will continue with a Fourth International Conference on Televised Instruction in 1981.

Jon Baggaley
Institute for Research in Human Abilities
Memorial University of Newfoundland
January 1981

TACIT AND EXPLICIT PROCESSES
IN TELEVISION DESIGN, PRODUCTION AND PRESENTATION

Deane W. Hutton

Salisbury College of Advanced Education
Australia

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ABSTRACT

This paper discusses two parallel but contrasting developments in educational television production in Australia. One development has been the weekly production of a nationally-broadcast educational television program by a commercial television network in which the planning team has based decisions mainly on collective intuition rather than any conscious effort to translate theory into practice. The other development has been a two-year research project undertaken by a College of Advanced Education which started with a set of explicit aims and production parameters and utilized formative evaluation with sample audiences to modify these guidelines. The author has been involved in both of these projects - as Educational Advisor in the first case and Project Director in the second.

Case Study 1: CURIOSITY SHOW

The Curiosity Show is the most widely broadcast childrens educational television program in Australia. It is aimed at 8 to 14 year olds and is shown in every state on a once-a-week basis. In the past nine years, approximately 350 editions of the program have been made. Despite the widespread distribution of the Curiosity Show constraints of time and money have meant that throughout this nine-year period, there has been little systematic analysis of audience needs and responses. The major guideline for producers and presenters has been intuition, based on accumulating experience. A tacit rather than explicit knowledge about the process of television design has emerged.

Case Study 2: SEE SAW

In this project, a deliberate attempt was made to derive practice from theory. The process began with structured discussions to establish audience needs and preferences with regard to production format, presentation style and content. Following the interviews, an explicit listing of design principles, including production and presentation variables, was constructed by relating stated audience preferences to research findings. A sample program was designed, produced and then screened to evaluate content and style. Following the completion of questionnaires, the design principles were reformulated for the second program. In this approach, stated audience needs and preferences have provided the major consideration for program designers and presenters.

The paper concludes with a discussion of the potential and limitations of both tacit and explicit approaches to educational television design and presentation. Current attempts to reconcile the two approaches are described.

INTRODUCTION

There are basically two ways in which I can learn to ride a bicycle. I can learn by studying the physics of cogwheels and chain drives and the mathematical formulae for momentum and balance, or I can learn by jumping on the bicycle and trying over and over again until I can ride it. Polanyi (1966) calls the first type of learning "explicit knowing" and the second type "tacit knowing". It is, of course, possible to have both, or just one type of knowledge without the other. I may know that in order to maintain balance it is essential to compensate for any angle of imbalance (a) by steering a curve of radius (r), on the side of imbalance, which is proportional to the square of the velocity (v) over the angle of imbalance (i.e. $r = \frac{v^2}{a}$). But I may fall off the bicycle! On the other hand, I may manage to keep my balance without having the slightest idea how I am doing it, or with an entirely wrong idea of what is happening

in the bicycle, in my muscles and in my brain. Perhaps it would be ideal to have both explicit and tacit knowledge - but if I can have only one, which should come first?

Before attempting to answer that question, let us consider some other examples. In learning to play the piano, should theory precede practice or practice precede theory? How about piloting a jet plane - systematic instruction or trial-and-error learning in the sky?

And what about sporting skills, business management, classroom teaching, making love, raising children and relaxing? For the practically-minded, tacit knowledge may take pre-eminence over explicit knowledge. But a pragmatic, intuitive, tacit approach may also carry a greater risk of failure. In some learning situations, such as piloting a jet and parachute-jumping, the spectre of failure may force us to start with an explicit analysis of the complex activity and perhaps some graded simulation exercises based on this.

EDUCATIONAL TELEVISION

Where does the design, production and presentation of educational television fit into the scheme of tacit and explicit knowledge? Should we approach television production as eager young cyclists or trembling novice paratroopers? Too often there is little or no choice. Research and experimentation is expensive and the careful construction of explicit systematic guidelines for design and production is slow. Since educational television is frequently given a 'Cinderella' status, there may not be any alternative to jumping in at the 'deep end' - basing design, production and presentation decisions on intuition and trial-and-error. In many television networks and stations, educational programming is a poor relative to news, sport and entertainment.

Australia has a dual television system with the government-owned, but independent, Australian Broadcasting Commission on one hand; and three high-rating, privately-owned commercial networks (Seven, Nine and Ten) on the other hand. The Australian Broadcasting Commission (ABC) has a well-established and substantially-funded Education section which has a responsibility for producing school programs for classroom use. The ABC is relatively free of governmental control in this and its other functions. The commercial networks, however, have come under increasing government control and public scrutiny - especially with regard to their performance in the area of childrens television.

CONTROLLING TELEVISION: THE AUSTRALIAN CONTEXT

The arena within which childrens educational television has evolved in the last decade has been a national framework of formal inquiries, growing public concern, changing guidelines and increasing governmental control. Some of the key events (Hutton & Morrison, 1980) are summarized below:

1971 Broadcasting Control Board (BCB)

The BCB issued its Guidelines for Childrens Television which required all commercial television stations to broadcast one hour of educational programming per week for school-age children. The Seven and Nine networks commenced national magazine-style educational programs while member stations of the Ten network each began their own local programs, including 'game' and 'panel' shows.

1972 Broadcasting Control Board

The BCB reviewed the new educational programs which had been developed. This led to a number of changes in the Nine network program, including the elimination of furry animal characters and the introduction of the name Curiosity Show.

1976 Postal and Telecommunications Department

The department carried out an analysis of postal and telecommunications services in Australia. Among the recommendations was a suggestion that the Broadcasting Control Board should become the Australian Broadcasting Tribunal with increased responsibilities and powers.

1977 Australian Broadcasting Tribunal (ABT) was established.

The ABT conducted a public inquiry into the concept of Self-Regulation for Broadcasters. The tribunal recommended greater control of programming for children and put forward the notion of a special 'C' classification for approved childrens programs.

1977 Senate Standing Committee on Education and the Arts

A Senate Committee of the Australian federal government conducted a public inquiry into The Impact of Television on the Development and Learning Behaviour of Children. The report from this inquiry made a number of recommendations, including the proposal that an independent production unit should be set up in Australia for the specific purpose of developing childrens programs.

1978 Australian Broadcasting Tribunal

In Adelaide, South Australia, the ABT began its series of License Renewal Hearings. Many of the public submissions reflected a growing concern in the community for the quantity of childrens television programs in Australia.

1978 Australian Broadcasting Tribunal

The ABT established the Childrens Program Committee which had been proposed in the 1977 Self-Regulation Report. The Tribunal also announced that 'stations' would be required to broadcast three hours of 'C' classification material per week in 1979.

1979 Childrens Program Committee (CPC)

The CPC established a set of guidelines for stations preparing programs for 'C' classification. Subsequently, the committee examined programs which were submitted and either accepted them ('C' classification or provisional 'C' classification) or rejected them as unsuitable. In July 1980, the requirement for three hours of 'C' material per week was increased to five hours per week.

1980 Broadcasting Information Office (BIO)

The BIO was described in reports from the Australian Broadcasting Tribunal as an organization which would collect data on broadcasting in Australia and undertake research studies on the effects of television in the community. The BIO was established in August 1980.

Against this background of changing regulations and guidelines, many explorations, both large and small, into the relatively unknown seas of Australian childrens television have taken place. The remainder of this paper describes two such projects with which I have been closely associated.

CASE STUDY 1: CURIOSITY SHOW

Since 1971, I have worked, on a free-lance basis, with the Nine Network as Educational Advisor, Writer-Presenter and member of the Production Team for the Curiosity Show. In nine years, we have produced approximately 350 editions of the program. In that time, 12 people have been involved as members of the production team, 26 people have served as presenters and five studio directors have been involved with the program. The color television studio in which the program is produced (NWS 9, Adelaide) is a multi-million dollar complex with technical facilities which are of international standard. Each week, some 25 people are involved in planning, producing

and presenting a one-hour program. Every year, 39 editions of the Curiosity Show are produced and distributed to 35 television stations around Australia. The estimated viewing audience is currently between 600,000 and 700,000 per week, including many people on either side of the 8 to 14-year-old age range which comprises our primary target audience. The Curiosity Show is broadcast by more stations than any other childrens program in the country (Children's Program Committee, 1980).

Despite the widespread distribution of the Curiosity Show, constraints of time and money have meant that, throughout this nine-year period, there has been:

- * no systematic investigation of the needs of the audience
- * no systematic analysis of audience response to the programs produced
- * no systematic review of effectiveness of individual segments
- * little systematic long-term planning.

The production of the Curiosity Show has been, unashamedly:

- * a hand-to-mouth existence
- * a struggle for survival
- * modified by trial-and-error
- * based on the collective intuition of members of the production team.

What we have done has been pragmatic rather than theoretical; heuristic rather than empirical. We do not apologise for this. Our knowledge about childrens television production has developed as a result of our practical involvement in the medium. Our approach to television planning and production has been largely tacit - based on intuitive guidelines rather than explicit rules and systems. In a sense we have had to help in pioneering a new, largely uncharted area.

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For producers, there are two fundamentally different ways to regard the television medium. They can adopt the line that television is merely a passive carrier of information and that *content* is the all-important feature of the medium (Carpenter, 1968). Alternatively, they can say that the medium *is* the message and that the peculiar characteristics of television are more important than program content (McLuhan, 1964).

The impartial observer might well conclude that the Curiosity Show team has assumed that the content is more important than the carrier. We have developed a basically verbal television program. The very evidence of our planning is purely verbal - running sheets, shooting schedules, voice-over scripts, written questions and answers - but rarely a storyboard! We have recently tried viewing randomly-selected 10-minute portions with the sound switched off. We have followed this with 10-minute portions with the picture switched off. Usually, 'sound only' communicates much more information than 'picture only'. This might seem to be an indictment of our understanding and appreciation of the medium we are using, but it is probably more a reflection of the lack of time and personnel for detailed planning.

Recent additions in production personnel have given us the time to begin planning the way we have always wanted to. We are beginning to ask these two questions of any segment which is being planned for the Curiosity Show:

*What visual elements are incorporated in the idea to be presented?

* How can the capacities of television as a communication medium be used most effectively to transmit these visual elements? In other words, how can we make each segment *visually* interesting? Although these fundamental questions have been implicit in the planning of some of the writers and presenters for years, only now are they becoming a stated part of the overall design strategy for the program.

Despite our apparent preoccupation with *content*, on the Curiosity Show, we have never had a set syllabus. Nor has there been any explicit curriculum philosophy. The content has depended on the collective interests of the production team.

Budget constraints in the early years forced us to develop as an 'ad lib' program rather than a fully-scripted one and this has had two important effects on the direction in which the program has evolved. First, it has given the program a believable, conversational style which is apparently well-received by children. Secondly, it has fostered the development of the writer-presenter as an integral part of the program format. In most segments we are seen presenting ideas, information or problems which we find vitally interesting. We are being ourselves!

The program was never intended to be aligned with a particular subject area and yet it is perceived by many viewers as a Science program. This is simply a reflection of the fact that the two writer-presenter-presenters-educational advisors (Deane Hutton and Rob Morrison) have academic backgrounds and current interests in science and technology.

However, we attempt to convey a number of attitudes which we consider to be more important than specific, factual knowledge. These are:

- (1) an enthusiasm for learning
- (2) an understanding of the processes of inquiry in everyday life
- (3) a respect for living things and the environment generally
- (4) openness, frankness and honesty.

It has been said by some commentators that we are involved in pro-social modelling in the Curiosity Show. For children this is undoubtedly important (Bandura, 1976). However, if we have been doing it, it has been incidental and has evolved intuitively rather than being part of an explicit program to influence attitudes.

The Curiosity Show production team has acquired tacit knowledge about childrens television. Our continued existence suggests that we must have been doing some things right - intuitively. But why do some things work while others do not? We are now attempting to develop explicit knowledge about the planning and production that we have been involved in for so many years. We are beginning to undertake audience surveys; to analyze responses to individual segments and whole programs; to make our aims and objectives explicit; and to compare strategies for planning programs. Have we been back-to-front (as well as upside-down) in our approach to childrens educational television in Australia? Or is this order of doing things appropriate?

CASE STUDY 2 SEE SAW

From 1977 to 1979, a joint research project was undertaken in South Australia by Salisbury College of Advanced Education and NWS Channel Nine. The aim of the project was to develop pilots for childrens television 'specials' - based on what children said they would like to see. The programs were to have the series title See Saw.

A group of faculty members and senior students, under my leadership, at Salisbury College commenced the project with a series of interviews with school children (ages 11 to 16) - asking what they would like to see in a program designed especially for them. It emerged that most stated a preference for a magazine style program rather than solely sport, music, drama or news and several topics kept reappearing in the 'high priority' and 'low priority' lists from both elementary and secondary schools. The following lists summarize these polar groups.

High Priorities

Comedy
Pace
Career information
Pop music (limited)
Science and technology
Social problems ('open-ended')
Definite theme (with contrasts)

Low Priorities

Classical music
Dance
History
Geography
Other cultures
Social problems ('hard sell')
Child and teenage presenters

With these guidelines in mind, the faculty and students began scripting the first pilot program. The theme chosen was "Growing" with particular emphasis on young and old things and people. After further discussions with school children on the content and approach in script segments, the program was produced with the studio, outside broadcast and film facilities of Channel Nine. The 25-minute program was fully-scripted, contained 21 segments and included more than 60% of material from outside the studio.

After watching the pilot in separate groups, children aged from 11 to 16 years completed an attitude questionnaire, a cognitive test and participated in open discussions about the program. The questionnaire and test scores were subjected to a computer analysis which related them to each other and to learner variables, including age, grade level and sex. Correlation co-efficients and analyses of variance were carried out. The following list summarizes audience response to the first edition of See Saw (Hutton, 1977):

(1) Program Acceptance

18 of 21 program segments received positive ratings (on 0-5 scale)

(2) Effective Program Components (on attitude scale)

Comedy - rated extremely high

Outside film - very high
Instructional segments - high
Musical segments - high
Interviews - low

(3) Individual Differences

Music - preferred by higher grades
Instructional segments - preferred by males
Comedy - preferred by males

(4) Attitudes and Learning

Students who liked comedy scored higher on the cognitive test.
Students who liked presenters scored higher on the cognitive test.

On the basis of these results, a second pilot program of See Saw was produced. This program centred around the theme 'Sickness and Health' and included segments on:

- * ambulances
- * blood transfusions
- * a tonsil operation
- * a vet at work
- * a doctor examining a patient
- * hospital machinery.

From the open discussion with the audience groups which reacted to the first pilot, it was clear that children wanted an element of comedy to run right through the ("... even the serious bits!"). Accordingly, one of the presenters adopts the role of 'clown' patient in the ambulance, blood transfusion and doctor segments - as well as appearing in seven short sketches which have a medical theme.

Both editions of See Saw were broadcast by NWS Channel 9 in 1980 but, at present, there are no firm plans to make any additional programs. One of the problems from the point of view of station management is cost. Since the development of See Saw included research and evaluation components, full scripting and substantial amounts of film, its cost per minute of screen time was more than four times that of the Curiosity Show which is already sold widely and well-received.

FUTURE DIRECTIONS

Whether we adopt an approach to television design, production and presentation which is primarily tacit or deliberately explicit, we are bound to notice advantages and disadvantages in each method. A tacit approach to educational television may be cheaper, more flexible and may lead to a product which is conversational, friendly and believable. On the other hand, programs may appear messy, repetitive and perhaps even tedious.

When an explicit, systematic instructional design model is used to develop television programs, we may be in a better position to take advantage of research findings, to maintain focus on specific objectives and to generate products which are neat, tidy and pacy. However, there is also a danger that the programs may become rigid, 'formula-television'. Also, systematic instructional design is inevitably expensive.

Perhaps it is worthwhile remembering that the problem is not really a choice between tacit or explicit design processes, but rather a question of deciding which should come first. Polanyi is unequivocal on this point. He says, "While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is *either tacit or rooted in tacit knowledge*. A wholly explicit knowledge is unthinkable" (Polanyi, 1966, p. 374).

In the case of television design, production and presentation, I think there is a place for both tacit and explicit processes. But I am inclined to agree with Polanyi. Tacit knowledge should come first and any explicit knowledge about the design and production processes should arise out of experience. Theory should derive from practice rather than practice from theory. Instead of attempting to apply techniques from the physical sciences and insisting on what Wilson (1973) calls the myths of 'hard facts', 'value-free strategies' and 'replicability' in television research, perhaps we should be devoting more time to explaining what we already know works in television production.

I know from experience that certain techniques work well in childrens television. The use of humor, anomalies, subjective camera angles (Salomon, 1970), mental imagery (Visual Education Curriculum Project, 1980 a) and visual analogies (Visual Education Curriculum Project, 1980 b) all seem to enhance understanding and learning in children. I do not necessarily need random sampling, control groups, t-tests and levels of significance to tell me this is so. Experience tells me it is so in many situations. But I do not know the limits of these techniques nor do I understand *why* these strategies work the way they do. I also know that children and adults watch an emormous amount of television (Tindall, Reid and Goodwin, 1977). But I do not understand *why* television has this pull. I want to see research which will give me explicit answers to some of these why questions. It may not immediately make me a better television designer, producer or presenter - but it will almost certainly help me in communicating with others who are involved in these processes. Polanyi (1966) claims that the formalization of tacit knowing creates a machinery for precise thought and opens up new paths to intuition.

I have been riding the educational television bicycle for 14 years now. Much of that time has been spent in gruelling, single-minded, competitive, road races. I want to spend more time discussing cycling with fellow cyclists - and looking at where the bicycles are taking us.

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Dr. Deane Hutton is Senior Lecturer and Head of Educational Technology at the Salisbury College of Advanced Education, S. Australia. He has been foundation President for the Australian Society of Educational Technology and Director of the Visual Education Curriculum Project, a national project funded by the Curriculum Development Centre (\$187,000) and concerned with the use of visual materials in the schools.

APPENDIX

In presenting my paper on 'Tacit and Explicit Processes in The Design, Production and Presentation of Educational Television' I commented on the potential of the pooled invitations of the people gathered at this Conference. As a result of that comment, Jon Baggaley initiated a 'straw poll' on intuitive guidelines for educational television. Many people offered suggestions - both written and oral - and I have attempted to group them into some rather loose categories in the section below.

Some people pointed out the difficulty in suggesting techniques and probable effects without specifying other factors such as content, objectives, age level of audience, production facilities and available funds. My initial challenge and Jon's question were really looking for any broad general intuitive principles which might be in the minds of the designers and producers of educational television - and which might guide practice. Here are some of the points which emerged.

INTUITIVE GUIDELINES

1. Program structure

- 1.1 State the purpose of the program clearly
- 1.2 Make sure that the structure of the program is organized and apparent to the viewer
- 1.3 Use obvious identifying program features - such as catchy and recognizable titles and signature tune
- 1.4 Build deliberate pauses into the program.
 - Silence can: provide relief
 - heighten anticipation
 - provide time for such mental processes as storage, recall and problem - solving (particularly when the pause follows a rhetorical question).

2. Variety

- 2.1 Use visual/verbal variety. Don't maintain the same relationship between pictures and words for the entire program.
- 2.2 Vary the length of shots and segments
- 2.3 Vary the pace of segments within the program
- 2.4 Introduce conflict (verbal conflict; visual conflict; and conflict between the verbal and visual) to create tension and to maintain interest
- 2.5 Use humor to relieve tension, to motivate and to maintain interest.

3. Importance of the Visual

- 3.1 Present information through the visual wherever possible
- 3.2 Resist the temptation to over-verbalize - ie. using words to describe what is visually obvious
- 3.3 Use visual anomalies (such as incomplete or contradictory pictures) to stimulate curiosity
- 3.4 Use visual analogies in which familiar pictures are used to explain new or complex ideas.

4. Audience Identification

- 4.1 Use a live audience or on-location participants wherever possible
- 4.2 Insert audience reaction shots where appropriate
- 4.3 Incorporate dramatized segments or vignettes into instructional programs to aid audience identification
- 4.4 Look for presenters who are 'pleasant', 'warm', 'familiar' and lovable'!

SUMMARY

In the design and production of educational television, tacit and explicit processes are not antagonistic, nor need they be alternatives. They can be complementary. Intuitive principles,

derived from tacit knowledge, can often suggest questions for empirical research. Some intuitive guidelines may turn out to be wrong. Others may be limited to certain objectives, age groups or content areas. And if some of our intuitions are supported by empirical studies, we may still be left with the important question, "Why does this particular technique have this particular effect?" This may lead to move intuitive hypotheses and move empirical testing.

Explicit knowledge can be an important partner to tacit knowledge. Michael Polanyi describes this inter-relationship when he says, "Formalization of tacit knowledge creates a machinery for precision in thought - and opens up new paths to intuition".

To me, one of the most exciting things about this conference has been the opportunity for researchers and producers to share and compare their tacit and explicit knowledge. It has been enlightening to see how the intuition and systematic research of others can question, reinforce or modify our own approaches to the design and practice of educational television.

Deane W. Hutton

INTEREST AND PRESENTATIONAL FORMATS
IN TV INSTRUCTION

James V. Paluzzi
Kent State University
Ohio

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ABSTRACT

This paper, written for researchers in television production as well as producer directors with research backgrounds, discusses the relationship of interest to learning in general--and TV instruction in specific. Interest is seen as a learner's recognition of factors that lie in the direction of his self-expression, bringing him to identify with the content. Misconceptions of the role of interest in learning are discussed and specific examples of such abuses in instructional television production are given. The problems related to a will of effort approach to learning are contrasted with the pure pleasure approach typified in some ITV productions.

Five presentational formats are enumerated and analyzed in terms of the above mentioned view of interest: FACELESS NARRATOR, TALKING HEAD, INTERVIEW, DRAMATIC ENCOUNTER, and PARTICIPANT-OBSERVER. Advantages and disadvantages of each are compared. The application of the PEAC (Program Evaluation Analysis Computer) system is encouraged to test research questions regarding these presentational variables, with specific recommendations and cautions posited in accordance with the theory herein developed. Researchers are challenged to resist the molecularization of television production research in an effort to develop a dynamic philosophy of education, from which refinements to learning theory can be made.

INTRODUCTION

The purpose of this paper is threefold. First, it will investigate the relationship of interest to learning, with respect

to current practices in instructional television production; a theoretical framework to integrate interest with production values will be proposed. Secondly, five different presentational formats will be enumerated and analyzed in terms of this theoretical framework. Finally, research directions will be indicated with the intention of facilitating empirical evidence which can be brought to bear on our theory.

INTEREST AND LEARNING

Most instructional television production teams justifiably spend huge amounts of time in constructing goals and objectives for any given program. Sound pedagogical practice necessitates the development of these specific ends-in-view, upon which instructional strategies are based--and subsequent learner mastery is measured. As a society's demand for educational accountability increases, so likewise will the need for soundly constructed, purposefull educational objectives.

Too often, however, comparatively little attention is devoted to selecting the presentational modes by which the aforementioned program objectives are to be mediated. The banality of the talking head--and the show-and-tell demonstration--continues to plague us. There seems to be a prevailing philosophy which reasons that all the student needs is the basic experience of content: if he is motivated, he will learn; if interest is lacking, then the student must simply learn to deal with the content through sheer effort--creating a degree of self-discipline which borders on virtue.

On the other hand, certain practices in instructional television production resulting from the development of digital video effects and video animation have netted an equally alarming effect: the talking head can now shrink, expand, spin, flip-flop, push-off, freeze-frame, and soft-wipe his presentation to the outer limits of video-space. Advocates of this production technique posit that if the student's interest is attracted,

then the student will assuredly devote himself to the acquisition of the content presented, if, for no other reason than sheer pleasure.

Notice the commonality at the two extremes. Both view the objective, the end to be attained, as external to the self. A recent text in television production for education typifies this externality. Note also its emphasis of recall knowledge:

Learning depends on external stimuli which will promote learning. The organising of such stimuli is an instructional process. Learning is a complicated and little understood process which appears to have several phases. First, the learner should want to learn. Motivation may not be essential but it greatly facilitates learning. Next comes understanding. Exactly how this happens is not known.... If what has been understood is to be of long term use it has to be remembered, i.e. stored in the brain for future use. What has been understood and remembered is only of real value if it can be recalled. The learner needs to be able to take what has learned out of storage and use it. (Combes and Tiffin, 1978, pp. 40-41).

This cold-storage approach to education yields an impersonal knowledge that is foreign to the student--and, therefore, is rarely generalizable to everyday experience. The failure, at both extremes of production practice, to recognize the need for a student to personally identify himself with the educational objective results in a misconception of the relationship of interest to learning. Dewey (1895) elaborates:

This identical assumption is the externality of the object or idea to be mastered, the end to be reached, the act to be performed, to the self. It is because the object or end is assumed to be outside self that it has to be made interesting, that it has to be surrounded with artificial stimuli and with fictitious inducements to attention. It is equally because the object lies outside the

sphere of self that the sheer power of "will," the putting forth of effort without interest, has to be appealed to. The genuine principle of interest is the principle of the recognized identity of the fact or proposed line of action with the self; that it lies in the direction of the agent's own self-expression and is therefore, imperiously demanded, if the agent is to be himself. Let this condition of identification once be secured, and we neither have to appeal to sheer strength of will nor do we have to occupy ourselves with making things interesting to the child. (p. 265)

Interest, therefore, marks the elimination of the distance between subject and object, effecting a quality of organic unity. Baggaley and Duck (1976) relate this organic unity of self and subject to the highest level of viewer involvement, "at which active involvement in the implications of the narrative occurs". (p. 68) It is the process of "making systematic connections between the message elements he has sampled according to his ongoing interpretation of the whole." (p. 70) It is at this level that we may expect to see marked educational attainment. The use of television to inject the content into the student without taking into account his need for self-expression will most likely result in a passive viewer--he is marginally involved because what he sees does not tap those interests which abide within. Likewise, the super-mediation of content by means of special effects gimmickery also fails in maintaining a high level of viewer involvement; such a production may be effective in attracting attention, but this attention will most likely be based on aesthetic appreciation of the visual/aural imagery--not necessarily the content. This intermediate level of viewer involvement--not quite passive, not fully active--is typically found in situations where the viewers report their enjoyment of the program, yet fail to be able to operationalize the content. There is a difference between cultivating an interest and simply making something interesting. Dewey (1895) explains:

When things have to be made interesting it is because interest itself is wanting. Moreover, the phrase is a misnomer. The thing, the object is no more interesting than it was before. The appeal is simply made to the child's love of pleasure. He is excited in a given direction with the hope that somehow or rather during this excitation he will assimilate something otherwise repulsive. (p. 267)

Legitimate interest, on the other hand, is stimulated by the needs of the learner, who intrinsically values the end-in-view so as to desire the attainment of that end. This desire necessitates effort--the effort that results in the active level of viewing involvement, which is the requisite to meaningful educational activity.

The point is that, as instructional television producers/directors, we err in attempting to utilize production technique simply for the purposes of generating gratifying sensibilities in the learner. The emphasis of our technique should instead focus on how we might best present to the viewer a connecting link (a biologist would use the term 'synapse') by which the viewer's indwelling interest can be forward to significant ends.

PRESENTATIONAL FORMATS

In developing this theory, we can identify five possible presentational modes that might be used in instructional television production to facilitate this 'synapse' between interest and objective. Keep in mind that the categories are not necessarily mutually exclusive, nor are the general characteristics which follow without exception.

FACELESS NARRATOR--commonly accompanies footage shot on location. When the visuals are closely meshed with the script, the narrator can take advantage of this visual/aural redundancy, condensing a wealth of information into a brief time segment--thereby developing a quick pacing. The price we pay for this efficiency, however, is a depersonalized presentation. Since there is no personality to identify with, it is often difficult for the viewer to value the program objectives in terms of his personal needs. The quick succession of information normally conveyed via this format resembles a hypodermic syringe, rapidly injecting the viewer with distilled knowledge. This treatment can, at its worst, turn a viewer's genuine interest for the subject-matter into a passing interest--and a passive level of viewing involvement.

TALKING HEAD--the traditional symbol of the instructional television program. Research indicates that this straight-on presentation to the camera is perceived as unreliable, in comparison to a presenter seen in profile (Baggaley & Duck, 1976, p. 91). This lecture presentational style is not natural in the normal course of human events; we derive meaning in everyday life via dialectical intercourse (at various stages of sophistication). Why, then, the preponderance given to this technique? It is obviously a carry over from the classroom situation, yet the television personality can rarely be stopped, questioned, or otherwise intereacted with. Furthermore, the viewer often knows less about the presenter than he does about the subject matter. Under these conditions, it is difficult to see how this format can sustain a connection between interest and objective, as currently practiced.

INTERVIEW--including in-studio and on-location interviews, (dyads and panel discussions). This production technique

introduces the human situation to instructional television, viz., the interaction which exists between interviewer and interviewee. The dialectic which occurs in the interview process is more typical of information gathering: we spend more time interacting than we spend in lecture. Whereas the lecture style is formal (as found in faceless narrator and talking head formats), the interview is familiar. If the interviewer is competent, the viewer should find himself asking questions through the interviewer--the beginnings of the connection. Interviews can be problematic, however, in that they can approach an abstract verbosity unless they are carefully organized to take into account the systematic hierarchy of connections that must be made to go from the point of interest to the end-in-view. The abstraction of interest and desire must be balanced by the pragmatism of effort and the ends-in-view.

DRAMATIC ENCOUNTER-- this format is perhaps the least utilized format in instructional television, yet its potential justifies its discussion. The dramatic encounter is essentially an interview conducted without any overt production consciousness. Instead of discussing the topic on an interview set, where the participants are ostensibly conscious of cameras, microphones, and the viewer, the dramatic encounter--oblivious to media presence--stimulates a credible interaction based on the objectives. The viewer can identify with the characters to an even greater degree, since the removal of the artificial traditional interview situation allows the viewer to vicariously experience that encounter. While television's ability to magnify, direct, and otherwise selectively focus the viewer's attention is ideally suited to this format, its use can be highly problematic. The necessity of constructing a realistic setting for the encounter can be prohibitive in terms of cost; more serious is the problem of securing talent that can interest effectively in the encounter--adhering to the objectives without appearing contrived.

PARTICIPANT-OBSERVER--perhaps the most unobtrusive presentational format. The NBC series, Lifeline, was an example of this approach, where the camera accompanies a physician throughout the course of his day, showing the viewer virtually everything the physician sees: from the morning rounds, to surgery, to the emergency room, and to the waiting room--where he or she must break the news of death to a family. The transparency of this format allows the viewer to close the physical distance between self and object ("it's just like being there"), thereby becoming a participant-observer. Since the characters on the screen are seemingly oblivious to the camera, any possible learner anxiety on the part of the viewer is minimized; the fear of the dread 'injection of knowledge', so prevalent in the faceless narrator and talking head formats, is uniquely absent. It, therefore, would appear that the possibilities for viewer identification are great. Yet, it is easy to see why this format is so rarely used: the format virtually necessitates shooting on location--a costly proposition, even with the advances in electronic field production. More problematic is the difficulty of dealing with 'talent'. This format seeks to capture people engaged in the behaviors the television program is covering; even if their cooperation is secured, there is no guarantee that these people can be counted on to carry on their normal activities with a camera and a sound crew following their every step. Normal behaviors have a tendency to become quite contrived before the camera lens.

Whereas other formats rely on structure, participant-observation has to be allowed to happen in due course, resulting in the need for extensive editing in order to maintain pacing. Additionally, the absence of narration places great emphasis on the viewer's observational skills--skills which have long been neglected by traditional instructional television formats and by education in general.

Careful consideration of the characteristics must occur in the planning for a production using such a format.

To summarize, we have, it seems, a continuum of presentational formats, the faceless narrator format comprising the epitome of the rationalist school of education--channeling the viewer through highly structured, conclusive answers. Towards the other side of the continuum, we find the participant-observer format, representing the progressivists--allowing the viewer to discover empirically the content of the objectives. As in any continuum, there are intermediate points, such as the talking head, interview, dramatic encounter, and undoubtedly others that have not been discussed here, including the possibility of hybrid formats yet to be formulated. Clearly, we have to date little conclusive evidence that suggests the superiority of a given production format. While our scientific tradition would favor the use of television to facilitate experiential learning based on the student's observational powers (leading in the direction of the dramatic encounter and participant-observation), there is at present an absence of corroborative empirical evidence that must support our theory before sound policy implications can be derived.

RESEARCH DIRECTIONS

The development of the Program Evaluation Analysis Computer (Nickerson, 1980) promises to prove a major breakthrough in researching the relationship of production variables to viewer effects. The immediacy of the computer allows the researcher to tap viewer impressions as they are forming during the viewing sessions--in addition to the traditional summative measurements. With regards to our research question concerning the efficacy of various presentational

formats, specific research guidelines can be suggested.

It would seem wise to avoid attempting to make measurements of a 'viewer interest' factor for the various formats. The possibility for contamination by confounding variables is highly probable; the use of production variables such as humor, music, and special effects often cannot be controlled across formats. Even if it were possible to control for these variables, we encounter problems with respect to the meaning of interest: are we truly measuring interest, the recognition of factors that lie in the direction of the viewer's self-expression which brings him to identify with the content, or are we merely measuring pleasurable sensations? The fallacy of pandering to the latter has already been discussed.

We might, instead, look at the effects of properly mediated interest, viz., learning. Here, caution is advised against measuring straight recall of information. We suggest that the mechanistic nature of this level of learning does not adequately discriminate on the basis of interest. Rather, we might attempt to present analogous situations to the viewer (after his respective format treatment) which are structured to test comprehension and application of the objectives. This procedure would appear to be more likely to test the power of the format to provide that synapse-like connection, which is the essence of learning.

Another possibility for research is more formative in nature. The design of the PEAC system allows us to take measurements throughout the duration of a program. The videotape could be stopped, or still-framed, while a question appears; another approach would be to simply key the question on the screen as the program is in progress, which might yield a more

dynamic measurement. With regards to our research question, this approach could be invaluable in measuring desire, a critical factor of interest. Dewey (1895) defines desire as the force which stimulates the means necessary to accomplish the realization of ends otherwise purely theoretical or aesthetic:

Our desires in a given direction simply measure the hold which certain ends or ideals have upon us. They exhibit the force of character, the Drang in that direction. They test the sincerity of character. A produced end which does not awaken desire is a mere pretension. It indicates a growing division of character, a threatening hypocrisy. (p. 279).

Accordingly, we might test the viewer at various points before, throughout, and after the program to determine the format's ability to generate--or arrest--desire in attaining the objectives.

Finally, the PEAC system should prove valuable in measuring source credibility across formats (discussed elsewhere during this conference). The results of such credibility studies could have a profound impact on production policy, since there is reason to believe that source credibility is related to viewer identification with the content objectives.

CONCLUSION

As social scientists, we must guard against the temptation to molecularize our research in television production to the point where we cease to have to relate our findings to a dynamic philosophy of education, upon which any intellectually responsible application of learning theory must be based. If left unchecked, the reductionistic tendencies of such a misconceived notion of empiricism shall lead us to perpetuate the trivialism of research--virtually devoid of substantive theory--which exists in some circles today.

Instead, we might indeed profit by embracing a radical empiricism, such as is postulated by John Dewey and William James, that will challenge us to conduct our science as if it really mattered. By looking towards the lasting meaningful effects of our research findings, based upon a sound theoretical framework, we stand to achieve a legitimate pragmatism.

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James V. Paluzzi is an Instructor in the Telecommunications
Division of the School of Speech, Kent State University, Ohio.

TECHNOLOGIES AND SYMBOL SYSTEMS:
ANALYZING DIFFERENCES BETWEEN AND
WITHIN MEDIA

Erhard U. Heidt
University of Bielefeld
West Germany

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Erhard U. Heidt
University of Bielefeld
West Germany

ABSTRACT

A number of media researchers and educational technologists have attempted to describe the differences between media by analyzing different types of media and by converting their results into classification systems and so-called media taxonomies. This presentation will not just repeat the general analysis of these efforts published elsewhere, but will focus on a special aspect: What can be learned from these classification systems about instructional television? In particular: (a) What distinguishes TV from other media? What are its unique features? Even if TV shares most of its characteristics with other media, are there more promising combinations of desirable features?

(b) What distinguishes one TV programme from the other? What are alternative design and presentation options, and what can be said or assumed about their effects?

It would be presumptuous, of course, to expect a clear and definite answer to these questions. An attempt, however, will be made to point at least to some areas of thinking and research from which contributions to an answer may be drawn. Among others, these are the research areas of cognitive development, visual or media literacy, mass communication, and semiotics.

It has been a trend in recent years to claim that media are instruments of enculturation and skill development and hence should be regarded mainly as symbol systems. This paper will look into the question of what this approach implies for our thinking not only about media in general, but about TV in particular, and for future research orientation.

INTRODUCTION

There is at least one notion in the field of educational technology which has never been seriously questioned and which can be said to be the very center of educational thinking. Simply put it is the belief that different ways of teaching and instruction influence the learning outcome. This notion has been upheld, in particular, with respect to media. Since the introduction of film, audio recordings and television (just to name a few of the more spectacular instances) led to a considerable extension of the field of material teaching devices, instructors - and here I include instructional planners and producers - have asked the question: Given my present teaching task, what medium will be the most appropriate and effective for achieving the desired learning result? This question, asked every day all over the world, is based on the undisputed assumption that there are educationally relevant differences between different types of learning material. But what are these differences?

This paper will look into what educational researchers have put forward so far as a contribution towards an answer. Since this conference has its focus on television production research I shall try to pay special attention to the questions resulting from that orientation.

WHAT DISTINGUISHES EDUCATIONAL TELEVISION. (ETV)

FROM OTHER MEDIA: A LOOK INTO EDUCATIONAL LITERATURE

A number of media researchers and educational technologists have attempted to describe the differences between media by analyzing different types of media and by often converting their results into classification systems and taxonomies. In a study, which is mainly concerned with more theoretical aspects of a classification of instructional media (Heidt 1978), I analyzed various efforts to find out what they contribute

towards a theory of educational media. The result of this study is rather disappointing: none of the attempts under investigation resulted in a comprehensive and conclusive classification of instructional relevance neither for research nor for selection purposes.

This paper will not repeat the general analysis of media taxonomies but will take a new look focusing on these special aspects only:

- a) what can be learned from these classification systems about instructional television, in particular?
- b) what distinguishes television from other media? What are its unique features?
- c) what distinguishes one television program from the other? What are alternative design and presentation options?

In Bretz's Taxonomy of Communication Media (Bretz, 1971) television belongs to the highest class of 'audio-motion-visual media', which are capable of recording and transmitting all kinds of audio and visual information from print over line graphic to picture including motion. The other six media classes lack the possibilities of recording / transmitting one or several of these types of information, i. e. sound, picture, line graphic, print, motion. Film belongs to the same class as television, the only difference being that film and video tape are recording media, while television is the telecommunication device for transmitting these programs across distance in real time (Bretz, 1971).

Duncan (1969) arranges media in a hierarchical order proceeding from the simplest to the most complex aids and systems. The increase in complexity also means an increase in prime cost and generality: "The simpler and cheaper the aid, the more specific it will generally be to the selected audience and the task. This is not so much on technical as on economic grounds".

Television, in particular in its broadcast form, belongs to the group of most expensive media and is difficult to provide; hence it is more general, i. e. addressed to an audience (potentially unlimited) to allow the high costs to be justified.

Kemp's decision float chart for the selection of instructional media (1971) starts from an analysis of the learning task and the objective. Regardless of group size, whether individual or large size group, you arrive at a box which contains 'television' when you answer the following three questions with "yes":

- Vicarious or sensory experience?
- Audio-visual or multi-media technique necessary?
- Motion necessary?

The same box contains also "film" as an apparently equivalent alternative.

Briggs (1970) tries to facilitate instructional media selection by linking requirements ('if') to a suitable medium ('then'). According to his matrix television is a suitable medium for all kinds of learner characteristics, tasks, materials, and transmission requirements with the following restrictions:

- It is not open to flexible sequencing.
- In its broadcast form it does not allow for learner pacing, and its repeatability and re-usability are limited.

The medium 'motion picture', which allows for learner pacing, requires darkening of the room for projection.

Like Kemp's decision float chart the systematic approach to media selection presented by Boucher et al. (1973) takes as the starting point an analysis of the learning objective with respect to the four following requirements:

- Sense modality desired (visual, auditory, tactile or kinesthetic),
- modality of response (verbal/symbolic or performance),

- type of feedback, and
- type of interaction with learner.

Their 'media capabilities matrix' gives the following characteristics of television:

- All types of visual (including motion and colour) and auditory information can be presented; in both cases, however, no genuine three-dimensionality is possible.
- Presentation cannot be controlled by student response.
- It can provide informative feedback, i. e. it can give correct response without regard to the learner's actual responding.
- Live television does not allow for learner controlled repetition, while video recording does.

Film differs from television only in the respect that some devices in that category allow for selective student response control and for learner controlled repetition.

Dale's cone of experience (1965) is one of the best known efforts in the field of educational technology. He takes as the basis of his classification of methods and materials the degree of abstraction, the amount of immediate sensory participation, which decreases as one moves from the base of the cone to the top. According to his ordering, educational television is already much advanced towards abstraction; it belongs to the cone section comprising 'ironic experience', i. e. learning through observing. Compared with the more concrete layers of the cone television lacks the direct experience of touching, tasting, handling, and feeling. By using this medium students will be "involved only in an imaginative way". The only difference between television and film, both of which are treated in the accompanying text under the same heading, is the dimension of immediacy of television, its potential of live broadcast of real events.

Gagne's table, which comprises the instructional functions of various media (1965), does not contain the term 'television'.

In the preceding text, however, the author explains that he makes no distinction between motion pictures and television, since "from the standpoint of instructional functioning, they are the same". I take it then that the label 'sound movies' in the table covers also the instructional functions of educational television. The medium television can perform all instructional functions. The only one for which it can be used only over a limited range of content is 'inducing transfer'. The accompanying text does not give any hint why television is limited for that function nor what the limitations are. Our expectations, however, that television and film are the ideal and unproblematic choice of medium are a bit precocious. Although from the point of view of its potentialities, TV and film are "a truly marvellous instrument for instruction", Gagne has to admit: "Unfortunately, the sound film that exploits these potentialities to their full extent is a great rarity". Again there are no hints as to what the producer or the teacher can do to really exploit these potentialities. Exactly the same rating as television is given in this table for 'teaching machines'. This is a bit surprising since, in the accompanying text, a teaching machine is defined as a combination of "printed communication with still pictures".

A different approach towards describing the differences between media is chosen by Tosti and Ball (1969) who see the main reasons for the present unsatisfactory situation of instructional design practice and educational media research as the failure to distinguish between the really relevant classes of factors, and the confusion between presentational, content and gross media variables. The most significant feature of their model, therefore, is the distinction between medium and presentation form, both of which are to be considered as being independent of content. The following example should illustrate the difference:

A picture of an elephant or a verbal description of an elephant, both transmitted by television, use the same medium (television) but differ in presentation form (picture/verbal description).

A picture of an elephant on television and a picture of an elephant in a book use the same presentation form (picture) but differ in the medium (television/book). A picture of an elephant in television and the verbal description of an elephant by a teacher differ in both presentation form (picture/verbal description) and medium (book/teacher).

Tosti and Ball argue that the presentation form is the relevant area for instructional design and research decisions and that media are only carriers for the presentation form. They identify six dimensions of presentation, the exact specification of which will in each case be the basis for the selection of the most appropriate medium. The six dimensions are:

- (1) Stimulus encoding form (environmental structure, pictorial, symbolic, verbal),
- (2) Stimulus duration (length of time the presentation remains intact from persistent of transient),
- (3) Response demand form (covert, selective, constructed, vocal, motor, affective),
- (4) Response demand frequency (from sparse to frequent),
- (5) Management form or purpose (need, attainment, prescriptive, enrichment, motivation, systems support management),
- (6) Management frequency (frequency of decision to change presentation, from sparse to frequent).

A complete analysis of media selection possibilities would result in a six-dimensional matrix. Since this would be too complicated Tosti and Ball suggest a series of two-dimensional matrices, of which they give two illustrations for the first three dimensions of presentation. According to their tables video and film (I take this again as covering television as well) are suitable carriers if: the encoding dimensions is pictorial, the duration is defined as transient, and the response form required is covert.

If one would try to summarize what can be learned from the preceding specifications and comparisons of instructional media with respect to television, the result would be the following description:

- The most characteristic feature which distinguishes television from other media is its capability to convey all kinds of audiovisual information in colour and with motion. Although it excludes the other senses it still creates a feeling of realism which can lead to imaginative involvement.
- It is the most expensive medium and hence economically more appropriate for use with large audiences.
- There are hardly any possibilities for medium-learner-interaction. Although television can present the correct response, there is no learner control over pacing and repetition and no possibility of flexible sequencing.
- There seems to be hardly any difference between television and film. Even a teaching machine, combining print and still pictures, seems to be able to perform the same instructional functions.

If we make an evaluation of this result in the light of the questions we would like to have answered, then we have to admit:

- Apart from the lacking possibilities of learner-media interaction - and here the situation has improved considerably through the introduction of video recording devices - no relevant information can be learned about differences between television and other media with respect to educational appropriateness. I do not regard the statement that television can provide audio-visual learning stimuli while books or audio-tapes cannot as one concerning education appropriateness; to me it is more of a truism.
- Since all these classifications are concerned with characteristics of television in general considered as a technological system compared to other systems we learn nothing

about differences within the medium of television. One gets the impression that it does not matter how you do it as long as you do it on television. Only Gagne's complaint that the potentialities of television are hardly ever exploited is a hint that the selection of television as the instructional medium for a given task is not the end of problems for the instructional designer and producer.

- At least Kemp, Boucher, and Tosti and Ball try to base their classification on instructional considerations. They start from an analysis of the learning task and the objective. If the requirements of the learning task are identified as 'audio-visual and motion', then and only then do they suggest television or film as the appropriate choice. The crucial question remains unanswered: given a particular learning task and a particular group of learners, why should the stimulus be audio-visual, i. e. why should a television program because of its 'audio-visuality' achieve the best learning results?

Not only the attempts in media classification, but also media research during the last decade has not succeeded in identifying instructionally relevant differences between media in general nor between design and production variables in particular. Experimental research studies into media exist in abundance. Most of them compare two or more media in order to assess their relative effectiveness. All attempts, however, to extract generalizable conclusions from these studies have failed so far: either it was impossible to detect significant differences or the results were contradictory. Nevertheless researchers as well as media practitioners agree that there are differences between different types of media, that these, however, are only relative and of a more subtle kind than hitherto expected. Previous researchers in general tried to answer the wrong questions, i. e. they generated irrelevant hypotheses and employed inadequate methods and research designs.

In realization of these deficits and shortcomings two approaches have been developed in particular during the last ten years which attempt to attack the problem from a different angle. Although they have been under discussion among the so-called media research experts these ideas have not yet reached a wider audience in the media field. For reasons of clarity these approaches shall be treated here separately although they are closely connected. The first can be labelled the 'skill development approach' and the second the 'symbol systems approach'.

MEDIA AS INSTRUMENTS FOR SKILL DEVELOPMENT

Most research studies have used terms like film, television, book, audiotape, slide, etc. to specify the different media they are going to compare as to their instructional effectiveness. Each of these terms, however, covers a great variety of actual items. One has only to look at the number of films and TV programs all entitled Basic Concepts of Electronics to realize how different they are in reality with respect to the basic methodological approach to the topic, the sequencing and structuring of the presentation, the employment of special visual techniques, the use of animation etc. The use of the term 'film' or 'television' only to define each of these various items tends to conceal the real differences between them. It has therefore been suggested to define media variables in a terminology of specific attributes, which describe in detail the capabilities of that medium. Examples for this kind of analytical variable are the capacity to show motion, to present separate or simultaneous visual and auditory stimuli, to manipulate temporal and spatial dimensions, etc. These attributes should be taken as variables for media studies so that different learning results, for example, are no longer ascribed to the medium 'television' but to the media attribute 'presentation of a continual motion'. Such a result gives as yet no information about the technical realization of this

attribute. In this case it could be a film as well as a video-tape or a transparency with special effects. Research studies so far have shown that no media attribute bears an inherent general advantage. Neither motion (as against still visuals) nor colour (as against black and white) or any other attribute has produced a significant overall positive effect on learning. Their relative value depends upon the specific learning task: media attributes enhance learning only when they are not just an additional embellishment of the presentation, but when they serve an instructional function with regard to the specific learning task.

One of the central problems in every day instruction has always been how to pay regard to the individual differences between learners by choosing appropriate educational and instructional methods. By now the importance of individual differences has also been acknowledged in the field of educational media. Since different students in reality may react differently to the same sort of instruction the use of a specific item of instructional media may be effective for a certain type of learner but ineffective or even disadvantageous for another learner with other characteristics.

One may sum up these considerations by stating that media experts agree that the question so characteristic of most previous research ('which medium, e.g. television or text book, or which media attribute, e.g. colour or black and white, is better and more efficient than the other?') has proved unproductive. It should be replaced by the question: 'what media attributes are relevant for learners with what personality characteristics for what kind of learning task?'

These considerations resulted in an aptitude-treatment interaction approach (ATI) to the problem of media effectiveness.

From this point of view the instructional situation is seen as a complex system of interacting elements. Thus learning results cannot be explained by looking at the instructional measures or treatments only. The effects of learning in a particular instructional situation must rather be interpreted as the result of interactions between specific features of the treatment, in particular of instructional media, and specific aptitudes or traits of the learning individual.

One of the most convincing models about potential aptitude-treatment interactions which pays special regard to instructional media, has been developed by Salomon (1972). He argues that the crucial point in the reaction of a learner is the internal operation in processing the stimulus, the information. As the most important function, which media can fulfill with respect to internal learning operations, he identifies the function of supplantation. By this he implies that media can be designed deliberately in such a way that they explicitly present and thereby supplant, what the learner would otherwise have to do himself internally, based on our assumptions about the mental operations required for a particular learning task. Media now may differ with regard to the nature of the process supplanted and with regard to the amount of supplantation provided. Some media can show continual transformations, others only situations of a transformation. Some media can present only auditory information, while others have the potential for visual and iconic information. These kinds of structural media attribute can be compiled in a single list. It is, then, necessary to develop a list of functional media attributes 'which contains only those attributes having a unique psychological effect on the viewer' (Salomon and Snow, 1968). This latter list is a flexible subset of the former. As the function of a structural attribute depends upon the intended learning process, i. e. the task in hand, each change in the learning task causes - at least potentially - a change

in the functional value of the structural attributes. Thus the same structural attribute can be functional, neutral, or even disfunctional in different instructional situations. This again stresses the importance of the particular learning task for statements about the suitability and effectiveness of media.

These considerations imply that learner characteristics must be described in terms of internal operation abilities. Learning tasks, then, must be specified with reference to the internal operations they require. Finally, media must be described with respect to the different degrees of supplantation they can provide for these operations. It should be evident that in this approach subject matter in the sense of 'content or factual knowledge' has given up its central place to 'skill and ability' to be acquired in connection with content.

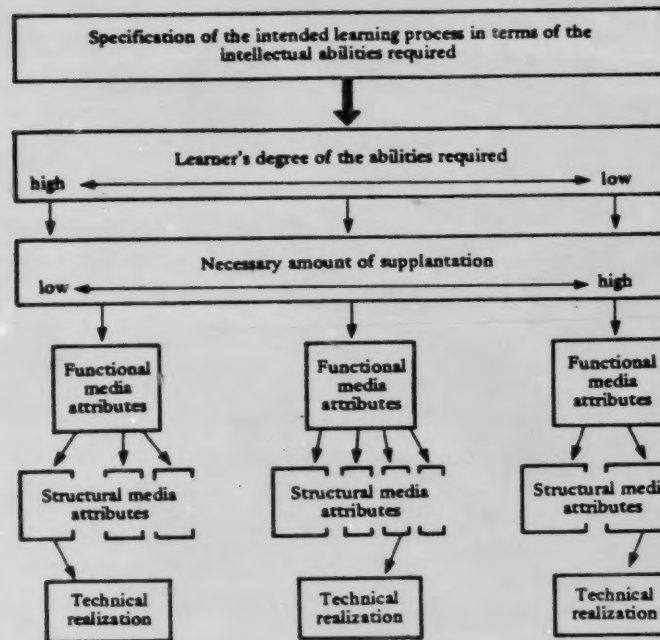
The appropriate categories for the specification of relevant media attributes seem to be a more detailed version of Tosti/Ball's presentation form, in particular of their 'stimulus encoding' and their 'stimulus duration' dimensions. For the visual field these categories should describe the various capabilities of representing, recording, or transmitting visual stimuli (with respect to size, shape, texture, colour, motion, temporal, and spacial relationships) as well as the degree to which the stimulus as a whole or certain of its attributes can be manipulated and modified during presentation.

The identification of such media categories is the first step only towards an appropriate description of differences between and within media. What is needed further is a method which shows how these categories may be utilized in an instructionally relevant way by the researcher as well as by the producer. The following table summarizes my suggestions for such a

Procedure which is explained in more detail elsewhere (Heidt 1978).

TABLE 1

Categories for the Specification
of Relevant Media Attributes and
Method of Utilization



The analysis of learning task and learner leads to a specification of necessary functional media attributes. They are described with categories referring to sensory modalities, to the encoding form and to the duration dimension of the stimuli required. The identification of these functional attributes should always result in the same categories, no matter who performs the analysis. The next steps, however, from the functional to the structural attributes and further on to the

Technical realization leave ample room for the creative mind of the skillful media designer and producer. The structural attributes of media are those which can be used in the sense of the functional attributes defined before. They include the whole scope of design techniques and can already be regarded as the feature of specific software/hardware configurations. In most cases there will be several alternatives, several structure attributes, which can be employed in the sense of a single specific functional attribute. Finally, one must decide which kind of technical equipment meet the structural specificational best.

One short example must suffice to illustrate this procedure (more detailed examples are given in Heidt, 1979); if the analysis of learning task and learner has resulted in the requirement, i.e. the functional media attributes, "display of complex pictorial information in colour (without motion) and ways to emphasize important details within that visual context" then possible structural media attributes would be: "display of a coloured picture plus zooming in on the details or marking the details by circles or arrows etc." Possible technical realizations, which would comply with these demands, would include television and film (which possess all the alternative structural attributes defined before) or slides and overhead transparencies (which lack only the structural attributes 'zoom' but which are an equivalent to zoom).

From this distinction between functional and structural attributes and their relationship it is evident that it will not be possible to compile a kind of glossary giving all structural attributes with their technical realization and then equating them with an instructional function, the reason being that structural attributes can be employed in the sense of a number of functional attributes (the same structural attribute thus becoming functional, neutral, or disfunctional) and that a single structural attribute is usually only one alternative of performing a specific instructional function.

Although the ATI approach opens promising ways for future media research, its relevance for the media practitioner seems to be rather limited. Its problem which most instructional designers and producers and in particular those in the TV field face, is: they do not know their target audience in relevant psychological terms but only in physical demographic terms, like age, sex, school level, social and economic status etc. Hence there seems no direct way of applying findings from ATI research with its subtle distinctions of different mental abilities, cognitive styles and other personality variables to the design and production of large scale educational television programs.

MEDIA AS SYMBOL SYSTEMS

It is almost the same group of researchers and media experts who have taken up another way of explaining and describing the functions and effects of media (most of them are contributors to the 73rd Yearbook of the NSSE Media and Symbols, edited by D.R. Olson, 1974). The underlying fundamental idea is identical with the one just described, viz. that media are not just mechanical transmitters - envelopes which will just carry whatever content is put into them - but themselves, largely independent of content, have important effects on our thinking. However, this approach has a different tradition (mainly philosophical and linguistic). It uses another kind of terminology, borrowed from the field of media or visual literacy and permits insight into new aspects of the problem.

The basic idea is the following: "Media are our cultural apparatus for selecting, gathering, storing and conveying knowledge in representational forms. Representation, as distinguished from raw experience, is always coded within a symbol system" (Salomon, 1979). Hence media should not be dealt with mainly as different technologies for information transmission, but in terms of the culturally relevant and determined symbol systems

they employ. Olson (1974) has pointed to the consequences of such a conception and the changes it implies:

"Perhaps the function of the new media is not primarily that of providing more effective means for conveying the kinds of information evolved in the last 500 years of a book or literate culture, but rather that of using the new media as a means of exploring and representing our experience in ways that parallel those involved in that literate culture. In this sense, media are not to be considered exclusively as means to preset ends but rather as a means for reconstructing those ends in the light of the media of expression and communication".

In dealing with the problem in how far new media technologies led to the development of new symbol systems and how these relate to the existing ones, these scholars, however deviate from the traditional approach of cultural philosophy, for which Cassirer's Philosophy of Symbolic Forms stands as the main and best known work and which regards language, art, religion etc. as symbolic forms of human experience. It examined their relations and their historical educational media as basically a semiotic one concerned with the specific syntactic and semantic features of different symbol systems.

The important differences between media, then, are differences of the symbol systems they employ. Since symbol systems differ with respect to the aspects of reality which they deal with and reveal, the different information potential of different media account for different ways in which human individuals or groups cope with reality. This approach is not mainly concerned with what media typically and actually do because of their specific symbol systems, but more essential is the aspect what media could do, i. e. what is their specific potential. It is not possible in the context of this paper to give a full evaluation or even a full description of this symbol systems approach. In the following paragraphs I can only refer to

some selected aspects in order to show what can already be said about its contribution to practical problems of educational media, in particular in the field of television production.

One of the basic assumptions underlying this approach may be labelled 'non-translatability axiom'. This axiom says that information which is coded in one symbol system cannot be totally, i. e. without any change (be it addition, loss or modification) of message, translated into another symbolic mode. The question, which is of most interest in this context, is: what, then, are the information we can only express in the symbol system of television and how do we express them?

As has been mentioned before the symbol systems approach is a semiotic one, the terminology and methodology of which derives mainly from the study of languages. Hence it is small wonder that media people went out in search for the 'language' of television and film and tried to find the 'pictorial vocabulary and syntax' (apart from the general literature on 'semiotics of film' cf. Anderson, 1972, Fleming, 1970, Pryluck and Snow, 1967, Worth, 1968, Pryluck, 1968). It is typical, by the way, that all these authors are solely or mainly concerned with the visual component only although it is a typical feature of film and television that they blend visual and verbal information, picture and sound.

Most authors have succeeded in identifying a number of basic units or elements and sometimes of their relation, e. g. :

- Image, motion, time, space, and sequence are described as the five parameters of film language, the first four covering the semantic, the last one the syntactic aspect of that language (Worth, 1968).
- Shots and their juxtaposition in editing have been seen as a parallel phenomenon to words and syntax in spoken language (Pryluck, 1968).

- Many authors have taken as the basic elements a listing of film production variables like camera perspectives, size, angle of view, camera movement, colour, split screen technique, lighting, etc.

None of these efforts, however, which approached the task on quite different levels, has resulted in a conclusive and generally accepted 'dictionary' or 'grammar book' for film or television production. If one takes Goodman's general theory of symbols into account (1968), then it seems that in principle such a search can never be successful. He suggests to describe the differences among symbol systems with respect to the degree of notationality they have:

"briefly put, a notational system consists of a set of separate discontinuous characters (e.g. a musical score) correlated with a field of reference which is similarly segregated (e.g. sounded pictures) so that any character in the system isolates the object or objects it stands for, or conversely, an object isolates the character that is correlated with it. Notationality contrasts with a continuous, unsegregated (e.g. pictorial) system for which no alphabet or set of disjoint characters exists" (Gardner, Howard, Perkins, 1974).

An application of this conception to television results in the following description and conclusions:

The predominant symbol system of television is its visual pictorial component. A pictorial symbol system is non-notational, syntactically and semantically dense and replete, i.e. the symbol (here: the picture and its elements) has no unambiguous relation to a referent and is open to alternative interpretation. It is difficult to find the right understanding from the exploration of alternatives since the exploration area is multi-dimensional, which means that (a) many features are potentially relevant, that (b) these dimensions are often continued. If we accept this description, then the task outlined by Pryluck and snow can never be solved.

In order to make educational film more effective they suggested "to specify in detail the full range of media communication characteristics (i. e. the elemental physical and structural characteristics) and to study the relationships between these and the full range of possible learning outcome. ... Until such (full) specifications are available, the applicability of film to instructional objectives other than the simplest will remain unknown" (1967). It seems impossible to answer the question: "what is the meaning of or even the predictable reaction of a viewer to this or that element of the code or symbol system of television?" It has to be superseded by the more complicated one: "If we want to imply this defined meaning in such a way that it can be inferred by the recipient/viewer, by what elements or television techniques can we do it? The use of which television techniques will enhance the probability that the viewer will take out of the film what we think we put into it?" The wording of this question implies already the possibility of alternative answers which are not fixed in number but open to the producer's skill, creativity, and inventiveness.

I would like to conclude this chapter with two remarks, or better: questions, which concern the ideas of media literacy and non-translatability.

From the discussion of media as symbol systems, which has taken up and further developed the concept of media literacy, I get the impression that we all - at least as viewers and recipients - are virtually visual illiterates. In everyday life, however, we watch films and television programs - some of us every night - and we do understand these programs at least to a large extent (whether we make the best use of them is another question). Hence it is not necessary - and not possible - to develop film or television literacy from zero like a new language, because it is largely pictorial and iconic, i. e.

the relation of sign or symbol to its referent is in most cases obvious. Would it not be advisable, then, to abandon the 'illiteracy concept' and to think in terms of a restricted and an elaborate code of television language? Those competent only in the restricted code could be considered as interpreting the pictorial symbols mainly on the 'surface' as depictions of real objects and events while the elaborate user of the code could proceed further to a 'deep' interpretation.

There is common agreement that the differences between media, i. e. between their symbol systems, are rather subtle. They will hardly result in differences regarding the content of information, the knowledge, but - if at all - in differences of covert, not directly observable skills. Apart from the practical testing problems of these skills a question has always baffled me: if we accept the non-translatability axiom, how can we detect what special skills or ways of structuring reality are developed through television and its symbol systems when we test in another symbolic mode (usually verbal) than the presentation employed (pictorial)? Are we in such a case not just - as Jahoda et al. (1976) have suggested - testing the transformation or recoding abilities of the learner?

FINAL COMMENT

Leaving out of account the terminological differences both approaches stress the point that media are not neutral transmitters of information. Even when they present the 'same' content they stimulate and develop different skills and ways of understanding and mastering one's environment by means of their different attributes and through the different symbol systems they employ. Because of the complexity of variables involved standard prescriptions or recipes are not possible. Hence both approaches point to the alternative design and production options for a specific instructional task and

objective and emphasize the professional competence of the producer as crucial to the effectiveness of an educational program.

Apart from their basic similarity and agreement, however, they emphasize different aspects:

- The skill development approach is concerned with differences both between and within media. Its main aim is to help the designer/producer/teacher to adjust the instructional environment to the needs of the learner (as defined by teachers or tests). Since the learner is mainly regarded as the object of instruction there is hardly any demand for learner participation but for operational definition of skills and their relation to media attributes.
- The symbol systems approach is mainly concerned with differences between media since these employ different symbol systems. One of its main aims is to help each participant, but in particular the recipient, of the communication process to develop the necessary media literacy. Since the learner is regarded as an active subject, a participant in the communication process, most advocates of this approach demand an active learner participation in media production and usage.

If we are talking about differences regardless whether they are covered by a theoretical approach as long as they only make a difference in reality, then the discussion must be complemented by an aspect which is often explicitly expelled from the two approaches described before. The effects and the effectiveness of media is due not only partly to their symbol systems but also to their technologies and their social context of usage. Some of the characteristic features of television pertain to it being an audio-visual medium (these are almost identical with film), others are related to it being a mass medium (these are comparable with those of radio broadcast). Take for example Sesame Street, which has been accepted world-wide as a model of

an efficient television program reaching and influencing its audience (it has even been criticized for being too effective). This result has often been attributed to its production techniques, display methods etc. This is true, but the impact of Sesame Street is due not only to television being an audio-visual medium (you could do all things on film as well) but to television as a mass communication system and an entertainment medium. Just imagine Sesame Street shown only at fixed schedules in a kindergarten environment and think about the change this would have made in impact!

Even if we do not leave the field of television, a change of the distribution and usage system will influence its educational possibilities. Berger (1974) has pointed to that aspect in his distinction between macro or mass television, meso or local and regional television, and micro or individual or group television. These distinctions result in qualitative communication, reception, and usage differences and will thus affect the educational function of television, thereby contributing to the difference within television and between television and other media.

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Dr. Erhard Heidt is Head of the Audiovisual Centre at the University of Bielefeld, West Germany.

FORMATIVE RESEARCH IN TELEVISION
PRESENTATION STRATEGIES: GUIDELINES
FOR EFFECTIVE PRODUCTION

Gary O. Coldevin
Concordia University
Montreal

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ABSTRACT

In the wake of the strenuous research emphasis on the 'teaching effectiveness' of television and its comparative strength versus other media, the present concern appears to be more sensitively attuned to how to best use the medium in a given situation. Within this broader inquiry, investigation into presentation effects has assumed a prominent position.

This paper initially provides an overview of 'significant trends' which have emerged from the available body of literature on production and performer variable research as a prelude of outlining their implications for producers and formative evaluators of educational television. It is concluded that the residue of evidence which might be directly applied in an operational setting is limited. Rather, the value of past research is mainly in providing models for replication by formative evaluators and in contributing toward middle range communication theory.

The discussion concludes with a setting forth of directions continuing research should ideally pursue during the current decade.

INTRODUCTION

After twenty-five years and some four score of studies directly concerned with television production and performer variables, the evidence accrued which might serve as guidelines for educational television production is slim. Regrettably, much of the initial impetus in television research was taken up with 'justification' arguments that television could indeed teach, that it could teach as well as a teacher, and that in most circumstances it was the most effective medium to use if cost considerations were put aside. Fortunately, the research pendulum is now returning to the important question of how to best use the medium in a given situation, and within this broader inquiry, investigation into production and performer variable effects has assumed a prominent position.

This paper will initially outline the useful residue of results which has emerged from the available literature as a prelude to outlining their implications for producers and formative evaluators of educational television. Critical directions research should pursue during the current decade follows.

A CONTEXTUAL FRAMEWORK FOR ORGANIZING FORMATIVE RESEARCH

Figure 1 outlines the broad areas and specific categories that production and performer variable research have followed to date. The rather haphazard framework which has emerged is perhaps symptomatic of the relative lack of direction or 'individualization' of research approaches, particularly during the early years of television. It is noteworthy that the bulk of significant studies has been undertaken during the past ten years and optimistically signals a more serious and sustained concern with this area of communication research.

FIGURE 1

Active production and performer variable research categories

PRODUCTION VARIABLES

Technical Variations

camera factors (angle & shot)
setting
colour vs. black and white
visual/audio-visual
reinforcement
still vs. motion pictures
screen composition

Content Organization

expository delivery
review strategies
cues and advance organizers
pacing and rhythm
order and balance of segments
humorous inserts
activity eliciting potential

PERFORMER VARIABLES

dress and rank
body type
age and appearance
sex
professional vs. amateur
eye-contact levels
missed cues
prestige and prior
knowledge
interaction with relevant
production variables

PRODUCTION VARIABLE RESEARCH

I. Technical Variations

1. Camera Angle

Nothing conclusive has been forthcoming with regard to the value of high, medium and low angle shots in terms of learning (Tiemens, 1970). A speaker's performance may be strengthened, however, through the use of a low angle shot (Mandell & Shaw, 1973), particularly when it is used sparingly (McCain, Chilberg & Wakshlag, 1977). And an objective camera angle (from the perspective of an observer) is preferable to a subjective angle (from the point of view of a person performing a task) for teaching complex skills (Grant & Merrill, 1963).

2. Camera Shots

In relation to maximizing cognitive acquisition, provided the viewer can clearly see the stimulus to be learned, the use of close-ups offers no advantage over long shots per se (Aylward, 1960; Cobin & McIntyre, 1961; Dwyer, 1970). The transition between shots, however, may be a crucial factor in stimulating learning, particularly among younger viewers. Salomon & Cohen (1977) found the use of zooms between close-up and long shots to be preferable to cutting for 5th grade learners.

Research which has compared the levels of interest generated supports the use of either medium close-up (Ellery, 1959) or close-up shots (Wurtzel & Dominick, 1971; Baggaley et al, 1980).

3. Setting

Nothing conclusive has emerged from the literature regarding the benefits of varied sets in terms of learning gains. But a speaker's credibility has been shown to increase when viewed against relevant pictorial backgrounds as opposed to plain sets (Baggaley & Duck, 1974; Coldevin, 1978a, 1978b). Further,

'location establishment' visuals are best displayed in a full screen background (Coldevin, 1978a) and 'symbol establishment' visuals in an over-the-shoulder corner screen location (Coldevin, 1978b). These results may be tempered, however, by the degree of 'professionalism' displayed by a particular speaker, an attribute which appears to have a direct correlation with the impact of visual backgrounds (Baggaley et al, 1980)

4. Colour versus Black & White

Colour offers no significant learning advantage over black & white TV, unless colour plays an essential role in identification (Kanner & Rosenstein, 1960; Balin, 1968; Frey, 1970; Kaneko, 1971; Reich & Meisner, 1972). Colour has been found useful in highlighting captions of more and less important material (Webster and Cox, 1974), and increased stimulation and involvement uniformly support its use over monochrome production (Scanlon, 1967, 1970; Schaps & Guest, 1968; Kaneko 1971).

5. Visual/Audio Visual Reinforcement

Visual reinforcement has been shown to be superior to an audio only format (Schwardzwalder, 1960; Tidhar, 1963; Lojdqvist, 1969; Coldevin, 1975a; Findahl & Hoijer, 1976), and a combined audio-visual technique offers significant advantages over either treatment alone (Booth, 1970; Findahl, 1970; McDaniel, 1970; Coldevin, 1975a; Findahl & Hoijer, 1976; Gunter, 1979). The singular use of audio is therefore not recommended as a reinforcement technique and a combined audio-visual treatment (redundancy in both channels) appears to provide the most effective teaching strategy.

6. Still versus Motion Pictures

Nothing conclusive has been forthcoming which might predict the advantage of motion pictures over stills with regard to learning. What the visual says appears to be more important than the technique used to say it. Motion pictures compared with stills did provide higher enjoyment and appeal ratings in one study (Findahl, 1970) and increased presenter credibility in another (Baggaley et al, 1980), but the variable requires further investigation before any definite guidelines may be forwarded. In the interim, the conclusion reached by Chu & Schramm (1967) holds.

" ...motion pictures do not add significantly more to learning than still visuals do, unless the continuity of action is an essential part of the learning task." (p. 94).

7. Screen Composition

While there may be general agreement that the left side of the screen is perceived and processed differently from the right side, no significant advantage accrues to either presenter ratings (Coldevin, 1979) or to the perceived attractiveness of, interest in, and retention from visual backgrounds (Metallinos & Tiemens, 1977) as a result of left or right side placement.

II. Content Organization

1. Expository Delivery

No significant differences in learning result from selecting a lecture, interview or discussion as an expository strategy. But higher interest is generated by both interviews (Mielke, 1970) and discussions (Brandon, 1956). Where lectures are used, positive audience reaction inserts can significantly improve performer ratings (Duck & Baggaley, 1974). Interviews can also be strengthened by re-recording questions put to an interviewee in vacuo after the initial recording sessions, i.e., by rephrasing

the questions more succinctly. This technique yields positive gains for both interviewer (Baggaley & Duck, 1975a) and interviewee ratings (Duck & Baggaley, 1975).

2. Review Strategies

Programs containing review segments, in general, stimulate superior learning when compared to productions in which these are lacking (Coldevin, 1975a 1975b). Summary reviews (those occurring at the end of instructional units) offer no apparent advantage over massed reviews (those occurring at various points within instructional units), but allowing a five second pause between the presentation of individual review statements produces significantly greater information gains (Coldevin, 1975b). The value of 'rest periods' for the assimilation of information has also been demonstrated by Pockrass (1960).

3. Cues and Advance Organizers

Only one study has looked at the value of information cues differentiated as to importance by colour codes (Webster & Cox, 1974). When students were informed in advance of seeing a program what the various colour codes implied, significant gains in learning were realized. Colour in combination with 'advance organization' are therefore relatively simple methods of increasing the potential learning from a given production.

4. Pacing & Rhythm

Increasing ITV pacing rates to approach commercial broadcast standards has been shown to improve verbal video comprehension or verbal descriptions of pictorial information (Schlater, 1970), and re-editing an animation film produced during the 50's into versions approximating two-thirds and one-third the original running time generated significantly greater attitude changes than the original production (Marks, 1974). Humorous inserts for kindergarten and first grade students were also

more effective when presented at a fast pace (Bryant et al, 1980). This variable requires constant monitoring but the value of past research has been to demonstrate that ITV pacing rates may be greatly influenced by commercial standards and a closer merging of the two systems would seem desirable.

5. Order and Balance of Segments

Research examining the contextual effects of high and low appeal bits in pilot shows of The Electric Company produced the following findings (Rust, 1971):

- 1). The appeal of a given educational bit is enhanced by following a bit with high appeal;
- 2). While the attention given to one bit influences the attention given to the following bit, the affect extends no further. High value but low appeal bits should therefore follow high appeal bits;
- 3). If a bit lasts more than one minute, its carry over effect diminishes.

6. Humorous Inserts

Inserting fast-paced humorous inserts into an educational production has been shown to stimulate significantly greater information acquisition, visual attentiveness, and enjoyment of and interest in the total program among kindergarten and first grade students (Bryant et al, 1980). The results disprove the theory of distraction and attention switching advocated by opponents of humour in educational programming. High levels of attentiveness to humorous episodes extend as well to surrounding educational material.

7. Activity Eliciting Potential

'Programmed' television lessons which call for active responses from students which can be immediately reinforced generate significantly higher information acquisition than programs using a straightforward delivery of material (Gropper & Lumsdaine, 1961a; 1961b). Given the dated nature of this research, however, the strategies should be re-examined in terms of both information acquisition and attitude change.

PERFORMER VARIABLE RESEARCH

1. Dress

Dress depicting different ranks of instructor(s) and branches of the Armed Services did not influence information gain and opinion change among U.S. Air Force students (Calkins, 1971). The methodology employed in the study is questionable, however, and the area remains open to further inquiry.

2. Body Type

Endomorphic types of presenters (heavy, fat) are perceived as the least credible of presenter stereotypes and hence likely to be the least effective (McCain & Divers, 1973).

3. Age and Appearance

Homophily, or the degree of perceived affinity in attitudes and values between a presenter and a viewer appears to influence to a large extent the amount of attitude change in a given program (Coldevin, 1977). A 'type cast' presenter selection across varied age groupings may have limited utility when attitude modification is the primary thrust of a particular production.

4. Sex

Female presenters are equally as effective as males in terms of credibility and acceptance ratings, and stimulating recall of news content (Whitakker & Whitakker, 1976).

5. ITV Instructor versus Trained Communicator

A trained communicator (professional newsreader) produced more information recall from a television lecture than an ITV instructor (Wardell, 1976). ITV instructors might therefore be advised to undergo training in commercial television presentation delivery.

6. Eye-Contact Levels

No evidence has yet surfaced which might predict an advantage of high versus low eye-contact in relation to learning (Westley & Mobius, 1960; Connolly, 1962). But medium eye-contact (55%) added more precision to a speaker's delivery than a high eye-contact (85%) treatment (Baggaley, 1980). Similarly, Coldevin (1979) found that in a desk script format (about 70% eye-contact) versus teleprompt simulation (about 95% eye-contact), a professional newsreader was rated as stronger and more organized. Both studies hence call into question the networks' reliance on maximum eye-contact in news delivery.

A profile angle was also found to be preferable to a frontal position when shooting an interviewee responding to questions (Baggaley & Duck, 1975b). The amount of prestige of symbolic importance a speaker brings to the interview, however, may bear heavily on the effectiveness of the profile condition (Davis, 1978).

7. Missed Cues

Slight missed cues (looking into an off-camera after a cut) do not detract greatly from a speaker's performance, but obvious and repeated mistakes affect not only the structural elements of a presenter's delivery such as organization and stability but perceived credibility as well (Coldevin, 1979).

8. Prestige/Prior Knowledge of Performer

Prestigious introductions have been shown to positively influence the ratings of a television lecturer (Baggaley, 1980) and are a relatively simple method of significantly enhancing a speaker's performance.

THE CONTRIBUTION OF EXPERIMENTAL RESEARCH

Although the direct and readily applied contributions of experimental research to an operational setting may be limited, the common thread extending throughout the range of studies conducted is the effects that even simple production format changes may produce. And in this lies its most potent offering, namely, as a guide to conducting research, as a prescription for both design and analysis, and perhaps most importantly, a listing of production and performer variables which might be profitably re-examined in both educational and informational television operations. Even those findings which may be said to have entered the middle range of theory such as the value of audio and visual versus audio-visual reinforcement should be re-tested in specific situations. Most of the research reported here was conducted only with college students and accordingly the generalizability of findings to other student groups may be spurious. The dual influences of television socialization and visual literacy also suggest continual monitoring of 'established' variable effects. In short, the bridge from experimental research to formative 'series' evaluation should aid considerably in the formulation of practical theory for ETV production.

FUTURE RESEARCH DIRECTIONS

Research efforts during the current decade should ideally follow at least four major paths:

- 1). Getting hold of the right questions or the important variables for analysis is perhaps the initial direction form which continuing research should start. Some of this can be accomplished through monitoring of contemporary production standards - and with discussions with producers - but in the past far too little cooperation has been forthcoming from broadcasters. Where 'in house' evaluation is not possible, for example, executive producers might commission academic research with funds initially allocated as an integral part of the overall production budget. The complaint by producers that little academic research is of practical value is due to the lack of dialogue between the two communities and future research should be directed toward results that may be meaningfully applied in a practical situation.
- 2). Tests which measure the iconic coding system of television message reception and processing should represent the cutting edge of methodological concerns, particularly with regard to information acquisition. It is anticipated that with a refined methodology of this type, much of the previous work concerned with learning gains could be profitably re-examined.
- 3). Performer variable research should continue to explore 'presenter enhancement' factors through the use of semantic differential scaling techniques. Significant advances in this area are described in a recent publication (Baggaley, 1980) in which four attribute 'clusters' for presenter ratings are suggested: Integrity (reliable, sincere, honest, direct), empathy (humane, pleasant, friendly), mastery (profound, strong, interesting, straight-forward) and poise (relaxed). These clusters are further divided into personal (integrity and empathy) and

professional (mastery and poise) dimensions. A continuing of this line of investigation so as to standardize testing instruments and the effects of each of these proposed clusters on cognitive and affective gains would be highly useful. For example, it may be found that Mastery and Poise or the Professional qualities of a presenter are the most important for the effective delivery of information, and Personal factors (integrity and empathy) for maximum attitudinal change. Dependent upon the objectives of a particular production, speakers could then be selected on the basis of empirically validated attributes. Production variable effects which might increase the effectiveness of a given speaker would then proceed from a rather more solid theoretical framework.

4). Finally, and as noted earlier, experimental research should continue to work toward theory building through the replication of studies in a variety of settings. The one shot study stands little chance of providing a substantial contribution even though it may be valid per se. Research generalizability demands replication as a prerequisite to acceptance by both academics and television professionals. And again, once a middle range theory has been developed through experimental research, it should be used as a back-drop for formative validation in an operational setting.

As a concluding note, it is suggested that a great deal more sharing of ideas and results of studies should take place between academics and professionals involved in formative evaluation. Academics live with journals and practitioners with inhouse reports. Conferences are an important step in relaxing this constraint but they are normally confined to a few people in a world of television. In sum, if experimental research is to have practical application, there should be continual interaction between professional evaluators, producers and academics. If not, the generation of material for the 'wired home' of the eighties may continue to operate on a fragile theoretical base.

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Dr. Gary Coldevin is Associate Professor in the Department of Education at Concordia University, Montreal.

USES AND EFFECTS OF HUMOR
IN EDUCATIONAL TELEVISION

Dolf Zillmann
Indiana University

&

Jennings Bryant
University of Massachusetts

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Jennings Bryant
University of Massachusetts

ABSTRACT

The involvement of humor in educational television is discussed in terms of both theoretical expectations and empirical findings. Recent experimental investigations designed to test the effects of humor use on selective exposure and on the acquisition of educational information are presented. The evidence is summarized as showing that for child audiences the involvement of humor, especially when semantically not directly related to the educational message and when rapidly paced, is likely to increase selective exposure and, independently, to facilitate the acquisition of information. For adult audiences, in contrast, only humor that is well integrated with the educational message appears to hold promise of enhancing information acquisition. In these audiences, humor that poorly corresponds with the educational message is likely to have detrimental effects on learning.

Once upon a time, education may have been serious business. In recent years, however, it has become permeated with humor and other elements of entertainment. Apparently to better serve its mission, education has not just tolerated, but has eagerly embraced the merger with entertainment. Levity in educational ventures that used to be characteristic of kindergarten can now be found in the college classroom. Instructors at all levels seem to work from the premise that teaching in an entertaining fashion can only help the cause of education. Humor consequently abounds in educational efforts from kindergarten to college (Bryant, Comisky, & Zillmann,

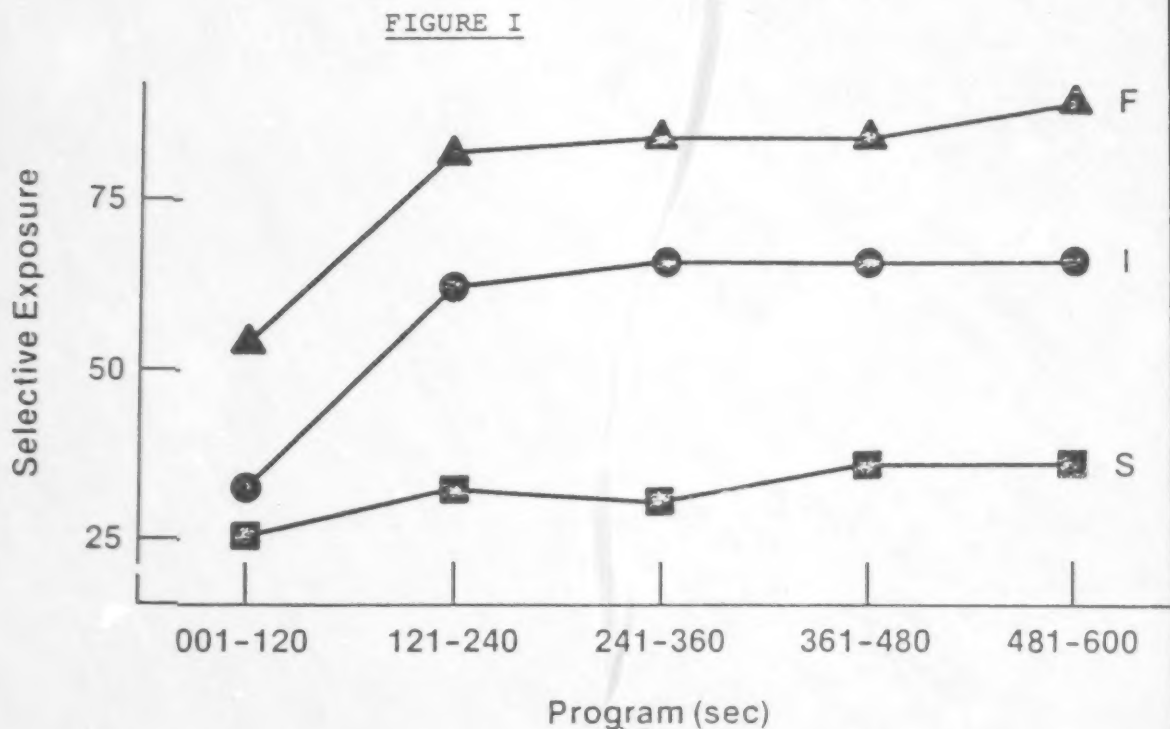
1979) and from the first reader to the university textbook (Bryant, Gula, & Zillmann, 1980). Nowhere, however, is the marriage of education and entertainment more obtrusively evident than in educational television, especially in educational programs for children (Bryant, Hezel, & Zillmann, 1979). Although some programs (e.g., Mister Rogers' Neighborhood) get by with little humor, most popular programs (e.g., Captain Kangaroo, Sesame Street, The Electric Company) rely heavily on many forms of humor--along with much other visual and audiovisual material adapted from pinball machines and similar devices of the carnival variety. These entertainment-embellished programs proved highly successful in attracting large audiences to the screen, and it has often been surmised that their success would not have been possible without the lavish involvement of elements of entertainment, especially humorous stimuli (cf. Lesser, 1974). It has been suggested, in fact, that educational television, because of its elusive audience, was virtually forced into a union with entertainment. Unlike the captive audience of the classroom, the broadcast audience is free to choose among several simultaneously available offerings. Any member of the television audience can at any moment turn away from an educational message in favor of comedy, drama, games, or sports. And unlike the readers of a textbook who tend to be motivated by interest and/or obligation, the television audience--or at least the majority of this audience--appears to be relatively unmotivated for exposure to information that provides little immediate gratification and that has little instant utility. The noncaptive broadcast audience is truly free to choose, and it presumably uses this freedom to maximize gratification deriving from exposure. Because of this, it must be expected that viewers, especially children, tune into programs that provide a high degree of immediate gratification, and that educational programs that fail to provide such gratification will fail in the competition with noneducational entertainment fare.

Clearly, the attraction of a sizable audience has to be a primary consideration in educational broadcasting. (After all, what good can come from the finest educational program if it fails to reach its target audience?) One might thus expect that much research has probed variables that could help draw larger audiences. One certainly would expect that the effects of humor and other forms of entertainment have been explored. Oddly enough, until recently there has not been a single study that addressed this issue directly. (The little research there has been conducted post facto on the success of certain programs; it did not use control conditions and, hence, does not permit an evaluation of the effectiveness of particular variables involved.) The investigation that has started to correct this situation (Wakshlag, Day, & Zillmann, 1980) is an experiment that explored the effects of the involvement of humorous episodes in an educational program on selective exposure under competitive viewing conditions.

In this investigation, educational programs were manipulated to create versions without humor and versions with humor in a slow, intermediate, and fast pace. The amount of humor was kept constant in all humor versions by combining episodes into blocks (12 individual episodes in the fast - pace versions; 6 blocks of 2 episodes in the intermediate - pace version; 3 blocks of 4 episodes in the fast - pace versions). The variation could thus be described as 'cluttering' vs 'clustering' of humor in an educational message. These manipulated messages competed against two others that were simultaneously available for display on the television monitor. Ostensibly in a waiting period, first - and second-grade school children could watch any of these programs for as long as they pleased; or they could, just like at home, turn off the set. Unknown to the children, their program selections were automatically recorded. This experimental procedure had proved useful as a simulation of noncaptive audience conditions in the study of preferences for different types of entertainment programs (cf. Zillmann, Hezel, & Medoff, 1980).

It was found, first of all, that the presence of humor in educational programs greatly facilitated selective exposure. Both boys and girls spent much more time watching the programs when they were embellished with humorous tidbits than when they were presented in unadorned form. The study, then, leaves no doubt that children whose television viewing is not supervised by parents or guardians (i.e., children who are not coerced into watching certain programs and who are free to watch as they please) will favor humorous over nonhumorous educational television. Or put another way: The findings show that nonentertaining educational television is likely to compete very poorly with other programs, especially with entertaining ones, whenever the respondent is free to choose from several available offerings.

Second, and more important to the message designer, the study revealed significant differences in selective exposure as a result of the particular distribution of humorous episodes in an educational message. As can be seen from Figure 1, the fast



of humorous stimuli--presumably because in the initial sampling of available programs such stimuli were more frequently encountered and because the more frequent encounter prevented further sampling of competing programs--attracted the viewers more rapidly and held them more effectively to the program. Successively slower pacing of humorous stimuli proved successively less effective in both regards. Clearly, if attracting an audience were the sole objective of educational television, humorous stimuli should be frequently interspersed in educational messages, ideally without disrupting the flow of this message. The continuity of the educational message is, of course, imperative; and to assure this continuity, the limits to placing humorous stimuli need to be recognized. However, preschoolers demands on attention span have to be kept to a minimum anyway, and the frequent employment of humorous stimuli is unlikely to be disruptive. Similarly, many educational messages to children in the lower grades (e.g., messages designed to teach spelling) are composed of short, self-contained units and can readily tolerate the frequent insertion of humorous stimuli. Generally speaking, then, it appears that, as long as essential message continuities are not disrupted, the employment of humorous tidbits in a rapid pace--the so-called cluttering--is superior to any slower-pace 'time outs for humor'-- the so-called clustering--in attracting and sustaining a broadcast audience.

The audience-drawing capacity of rapidly paced humor has also been demonstrated for adolescents. In an investigation that used high-school seniors as subjects (Schleicher, Bryant, & Zillmann, 1980) it was found that the fast pacing of humorous stimuli in educational programs attracted more students for longer periods of time to the screen than did the interspersion of the same stimuli at a slower pace.

Attracting and sustaining an audience, although critically important, is of course only the first step in the process of educating by means of television. The necessary second step is to get the educational message across--that is, to make sure that the information to be acquired is indeed being acquired by the viewers. And it is this second step that has produced most of the controversy over the use of entertainment features in contemporary educational television. In particular, the Singers (Singer & Singer, 1979; Singer, 1980) have taken issue with the fast pace of most educational television programs for children, arguing that such rapid-fire expositions prevent vital rehearsal processes and ultimately stunt the development of cognitive skills that are essential to learning. Notwithstanding such projections of long-term consequences that are most difficult to ascertain (cf. Zillmann, 1980), concerns that elements of entertainment in education can only distract from the educational message and thus impair the acquisition of information have been voiced for some time. Schramm (1973), for example, speculated that the respondents' enjoyment of humor, in particular, might extend into subsequently presented educational segments. The assumed cognitive preoccupation with humor would then interfere with the reception of educational information; or should the information be received, it would hamper the rehearsal and storage of this information. Early research on the effects of humor in instructional films, mainly conducted with captive and presumably very attentive military audiences (e.g., Lumsdaine & Gladstone, 1958; McIntyre, 1954), indeed tended to support the conclusion that the involvement of humor is more a hindrance than a help in accomplishing educational objectives (cf. Schramm, 1972). Schramm, (1973) further speculated that viewers might perceive educational segments in sharp contrast to any enjoyable humorous stimuli associated with them and thus be more dissatisfied with the

educational segments and possibly pay less attention to the segments than to the same educational segments without humor. Recently, McGhee (1980) added the suggestion that humor in educational television might create a playful frame of mind that could interfere with the acquisition of novel information mainly because it would make any rehearsing, which could be construed as effort and labor, seem undesirable or unnecessary.

Theoretical considerations, then, led mainly to the projection of negative effects of the involvement of humor on information acquisition from educational messages (cf. McGhee, 1980). Even writers who promoted fast-paced, entertaining educational programs for children seemed to concede that, on the whole, humor might be distracting; however, they tended to insist that humor that is well integrated in the educational message (i.e., that directly relates to it semantically) might have beneficial effects (e.g., Lesser, 1972, 1974). (The only aspect of humor use associated with unqualified positive projections concerned quizzes and exams and apprehensions connected with them. Based on Freudian reasoning (1958/1902), humor has been expected to alleviate tensions and anxieties; consequently, it should relax students who are uptight about exams and improve their performance. The evidence on this point (e.g., Horn, 1972; Mechanic, 1962; Smith, Ascough, Ettinger, & Nelson, 1971; Terry & Woods, 1975; Weinberg, 1973) is quite inconsistent, however (cf. Chapman & Crompton, in press; McGhee, 1980).)

Evidence suggesting that, counter to the distraction concerns, the involvement of humor in educational television might actually facilitate information acquisition comes from investigations by Hauck & Thomas (1972), Kaplan & Pascoe (1977), Davies & Apter (1980), and Chapman & Crompton (in press). The latter two of these investigations, in particular, pertain to educational television.

In both these studies slide presentations were used that can be regarded as acceptable simulations of standard educational television fare, and in both studies it was found that information acquisition from the humorous version of a program was superior to that from its nonhumorous counterpart. In the investigation conducted by Chapman and Crompton, there was a very close correspondence between humor and the information to be acquired. Children (five- and six-year olds) who had been exposed to zoo animals that were drawn either in a 'funny' or 'serious' fashion had to retrieve as many species as possible upon a letter cue. For example, the initial presentation of a camel was connected with the statement, "c is for camel;" and in the test for retention, "c" was the cue for retrieval. Because of this linkage between humor and the item of recall, it can be argued that in this investigation it was the humorous item itself (not a potentially nonhumorous, educational item) that was better recalled. However, in the investigation by Davies and Apter in which somewhat older children (eight- to eleven-year olds) served as subjects, the humorous stimuli were only minimally relevant to the topics being taught, and it appears that the humorous format alone effected superior retention of the educational items presented.

An experiment conducted by Zillmann, Williams, Bryant, Boynton, and Wolf (1980) explored the effects of humor on information acquisition from educational television more directly than other investigations. Educational television programs were specially designed and produced on topics that were novel to the children (kindergarten and first-grade students). In order to test for information acquisition, tests were constructed to determine the extent to which subjects recall items and comprehend significant relationships. Various experimental programs were then created by inserting humorous stimuli that are characteristic of children's fare. Similar to the investigation by Wakshlag et al. reported earlier, humorous episodes were distributed

differently to create a condition of fast pace (individual episodes) and a condition of slow pace (two episodes blocked together, without changing either the sequence of presentation or the amount of material). (Since the humorous materials were added to the message proper, the humorous versions of the program were necessarily longer. Also, since the two distributions of humorous stimuli can be construed as different sets of message disruptions which may uniquely affect information acquisition, controls for both time and particular distribution of humorous inserts were necessary. However, these additional controls produced effects that did not appreciably differ from the effect produced by the message proper, and it consequently suffices here to compare the humor versions against the message proper alone.)

The study, then, explored not only the effect of the involvement of humor, but the effects of the pacing of humorous episodes throughout an educational television program as well. The variation in pace should be of particular interest to the message designer, because it is a variable that lends itself to arbitrary manipulation. In this connection, it should be pointed out that in the discussed investigation the humorous episodes employed bore no particular semantic relationship with the educational message. Pace manipulations using such 'unrelated' humor are obviously virtually unlimited. Implications for message design notwithstanding, however, the use of such humor to achieve positive ends may seem futile because, as will be recalled, only the involvement of humor that relates directly to the educational message has been viewed as having a chance to facilitate the learning of educational materials.

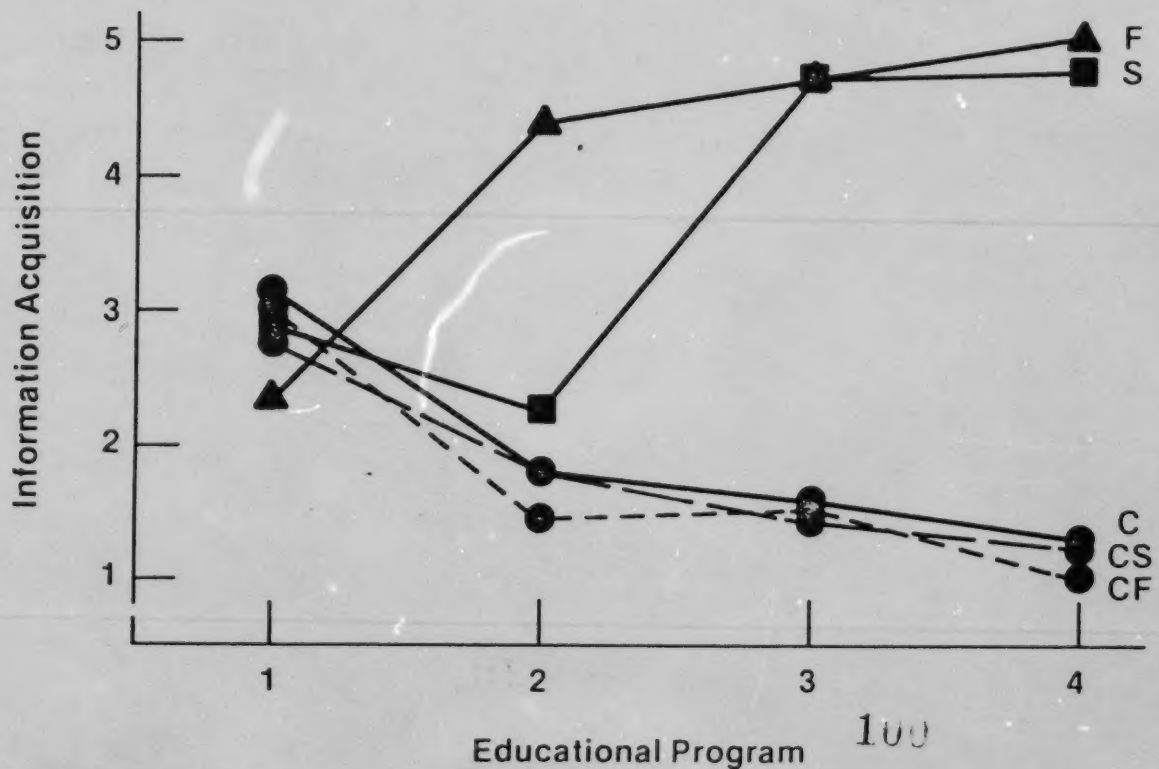
But is any beneficial effect of humor on the acquisition of information from educational television really limited to 'related' humor? Does 'unrelated' humor necessarily function as a distractor? It seems that in the past much of the reasoning on humor in educational television was based on the premise that audiences are highly attentive to educational programs. Indeed, if this premise is adopted it is difficult to see how humor can enhance information acquisition because, regardless of particular message characteristics, information acquisition should always be at a high level. This premise can readily be challenged, however. In general, television audiences are all but fully attentive; and children, in particular, may watch a cut-and-dry educational program with little interest and be semi-attentive at best. Just as the most motivated college student may find it difficult to be fully alert through a lengthy lecture, so may the child watching educational television, even if essentially interested in the contents, become nonalert, if not drowsy at times. And as the experienced lecturer might be able to break the monotony and regain the attention of the audience by saying something funny or doing something amusing, so might children's attention to the screen be revived by an occasional humorous episode.

If, then, one accepts the premise that attention cannot be at maximum levels for long periods of time and that educational messages are often met with less than maximum interest -- a condition conducive to the rapid fading of alertness--it becomes possible to project positive effects on information acquisition as the result of the involvement of humor, especially of humor that is rapidly paced. In line with this reasoning, Zillmann et al. proposed, in fact, that the interspersion of humorous stimuli in an educational program, whether or not the humor is semantically related to the educational materials covered, is

likely to serve an alerting function. The respondent who vigilantly reacts to a humorous episode will remain vigilant and alert for some time thereafter (cf. Berlyne, 1960, 1970; Tannenbaum & Zillmann, 1975); and during this period, they may more closely attend to the educational portions of a program and process incoming information more actively. As a result, the presence of humor should facilitate learning, especially when vigilance is revived often through the fast-paced placement of humorous stimuli.

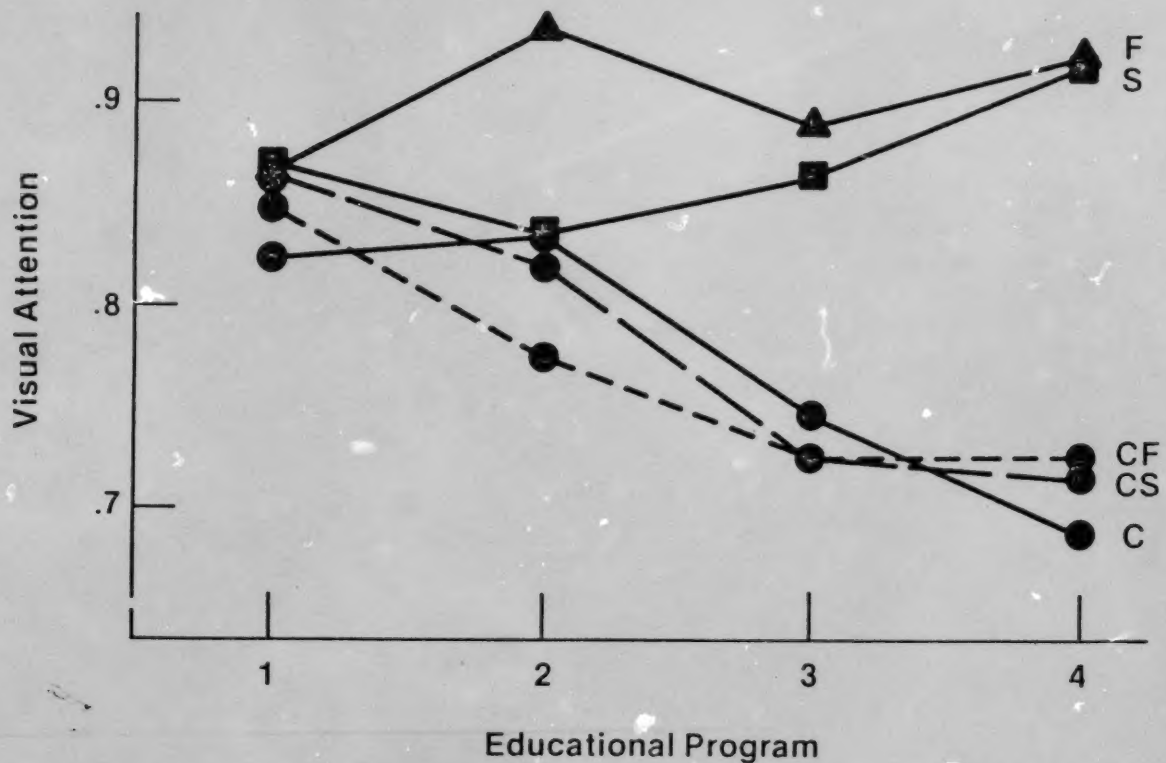
The findings of the investigation by Zillmann et al. are entirely consistent with such a projection. As can be seen from Figure 2, the interspersion of 'unrelated' humorous stimuli in an educational program resulted in information acquisition from that program that was superior to that from the educational message proper. The fast-pacing of humorous episodes proved to be particularly

FIGURE 2



effective: It produced the facilitating effect on learning more rapidly and, mostly because of this early effect, tended to produce a stronger overall facilitation. The vigilance interpretation is further supported by the findings on visual attention presented in Figure 3. Humor-induced vigilance apparently

FIGURE 3



carried over into the subsequently presented portions of the educational message. There can be no question, then, that "unrelated" humor, especially when paced rapidly, can enhance children's acquisition of information from educational television programs.

Bryant, Zillmann, Wolf, and Reardon (1980) carried out essentially the same investigation with somewhat older children (seven- and eight-year olds). The findings were consistent with those of the earlier study, but there was some indication that the learning-facilitating effect of humor becomes weaker as the child's age increases.

An experiment designed to test the vigilance explanation of the observed facilitatory effect of humor on learning more directly has been conducted by Bryant & Zillmann (1980) with children (five - and six-year olds) as subjects. These investigators argued that, if humor has its effect through the stimulation of vigilance, nonhumorous stimuli, as long as they have a similar effect on vigilance, should similarly facilitate learning. Consequently, nonhumorous stimuli that are commonly used as attention-getters (the audio-visual 'fireworks' of children's television; i.e., fast-moving colorful objects, exploding stars, and the like) were sampled, and their attention-getting potential and hedonic value (neutral vs. pleasant) were determined in a pretest. Humorous stimuli were similarly pretested and matched up on these criteria with the nonhumorous materials. In the main experiment, it was found that the interspersion of stimuli with a high potential to attract attention, whether humorous or not and whether pleasant or not, facilitated the acquisition of information from an educational program. No appreciable differences were found in the effect of humorous and nonhumorous stimuli. There was a tendency, however, for pleasant stimuli to be more effective than hedonically neutral ones of a similar attention-getting capacity.

The same investigation was carried out with seven - and eight-year olds. Once again, the effects of humorous and nonhumorous stimuli were comparable. However, in this investigation,

the effect of hedonic valence was stronger than that observed for the younger children. The more pleasant stimuli yielded substantially greater information acquisition than the less pleasant ones. Additionally, the effect of the variation in attention-getting potential was somewhat weaker than in the prior investigation, although the direction of the effect was the same.

Surely, these two investigations lend strong support to the vigilance explanation. Their practical implications are less clear, however. The studies show that audio-visual fireworks may do as good a job as humorous stimuli in recapturing the attention of an audience whose alertness is fading. This should not be taken to mean that both types of stimuli function equally well in the facilitation of learning from educational television. It should be remembered that in the investigations by Bryant and Zillmann the children could not turn another program. Had they not been a captive audience, they may well have turned away from the fireworks presentations. Contentfree audio-visual displays or displays with little meaning are unlikely to attract and sustain selective exposure as effectively as humorous materials, and their beneficial effects on learning may well be limited to captive audiences or to messages that feature these displays infrequently enough to be tolerated by a noncaptive audience.

While research on the effects of the distribution of humorous stimuli in educational television programs for children has produced clear-cut results, many aspects of the use and the effects of humor in such programs have remained obscure.

Variations in the funniness of humor, for example, failed to produce strong effects (Sapolsky, 1980). There are indications, however, that only mildly funny humor has a facilitatory effect on information acquisition. The involvement of highly enjoyable humor had no appreciable effect on learning. It is conceivable,

then, that humor that triggers intense mirth reactions--because, as Schramm (1972, 1973) had suggested, it preoccupies the respondent--might interfere with information acquisition to the point where it is inferior to that from the educational message without humor.

Research on the funniness of the source of educational information (i.e., the speaker or presenter) also failed to exhibit strong effects on learning (Sapolsky & Walker, 1979; Wakshlag, 1980). All a funny source seems to accomplish is to make the experience of watching educational materials somewhat more enjoyable. On the other hand, a study conducted by Cantor and Reilly (1979) showed that a teacher's use of a jocular language style enhanced information acquisition. At the same time, however, the joking teacher was less favorably evaluated by the children (sixth-, seventh-, and eighth-grade students).

Cantor and Reilly's investigation also included a variation in the use of 'related' humor. Compared to a no-humor control, the use of such humor (i.e., humor that is relevant to the concepts taught by the educational message) had no appreciable effect overall. Tracing the effect of the various humorous stimuli that were employed suggested that the use of irony, in particular, may have been confusing and have caused misinterpretations that impaired information acquisition. Since irony and similar message-distorting techniques are heavily used in children's educational television, this observation may prove highly significant. One immediate consequence is that it now appears that the classification of humor as 'related' is a confusing oversimplification.

Finer distinctions within this class are necessary. In fact, making these finer distinctions holds promise of clarifying and reconciling the conflicting findings on the effects of 'related' humor in children's educational television.

The issue of humor that is related vs. humor that is unrelated to educational messages is significant in yet another way: It seems to define a turning point in the effects of the involvement of humor in educational television programs for children vs. for adult audiences. For one thing, humor is usually not well integrated, semantically, with educational materials in programs for children. Visual and auditory humorous cues are, by and large, as often lacking correspondence with topics taught as they are directly related (Bryant, Hezel & Zillmann, 1979). In lectures delivered by college professors, in contrast, the use of humor that helps to make educational points dominates other uses, the involvement of 'unrelated' humor being comparatively rare (Bryant, Comisky, & Zillmann, 1979). These uses seem to reflect a good intuitive grasp of the effects of humor in educational endeavors--that, at least, is what recent research suggests. As we have seen, totally 'unrelated' humor in educational programs can greatly facilitate information acquisition in children. With age, this beneficial effect seems to weaken. The involvement of 'related' humor, on the other hand, poses a risk for children in that, while some forms of relatedness may achieve highly beneficial effects, many other forms such as irony, cynicism, and sarcasm--because they distort the related educational point--may foster misconceptions and thus impair information acquisition. It can be assumed that adult audiences, because of superior information processing skills, are far less likely to misinterpret reality-distorting forms of humor, and 'related' humor can thus be expected to be devoid of the discussed ill effects. Additionally, one might expect that adult audiences respond unfavorably to the involvement of obviously forced-in 'unrelated' humor. Humor that is well integrated and used to make points of interest can readily be accepted, but humor that has no apparent connection to the educational message, obviously interspersed to liven things up, may be met with impatience, if not with annoyance.

Be this as it may, recent research on adult audiences (college students) shows that in televised lectures the use of 'unrelated' and 'somewhat related' humor has detrimental effects on information acquisition (Hezel, Bryant, Harris, & Zillmann, 1980). According to this research, only humor that is well integrated with critical educational statements--that virtually helps to make important points--does not produce such negative effects and seems to hold promise of enhancing the learning process.

In summarizing all this it can be said that the involvement of humor in educational television programs for children, especially when unrelated to the educational message and when paced in a fast fashion, has most beneficial short-term effects. These effects are both in terms of selective exposure and in terms of the acquisition of educational information. For adult audiences, however, the involvement of humor seems promising only if the humor is highly integrated with the educational message. Humor that lacks such integration is likely to impair the educational process.

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Dr. Dolf Zillmann is Professor of Communication and Psychology at Indiana University; he is also Director of the Institute for Communication Research at Indiana University. Dr. Jennings Bryant is Associate Professor of Communication at the University of Massachusetts.

FIGURE CAPTIONS

FIGURE 1.

Selective exposure to educational programs as a function of differently paced humorous inserts. The programs, one at a time, competed with two others that were simultaneously available for display on a television monitor. The fast-paced interspersion of humor (F, triangles) proved more effective in attracting and sustaining an audience than the interspersion of the same humorous materials at an intermediate pace (I, circles); the latter, in turn, proved more effective than the interspersion of humor at a slow pace (S, squares). (Adapted from Wakshlag, Day, & Zillmann, 1980).

FIGURE 2.

Acquisition of information from educational programs as a function of the involvement of differently paced humorous inserts. The fast-paced interspersion of humor (F, triangles) proved most effective. The effect of interspersing humor at a slow pace (S, squares) developed more slowly. However, both versions containing humor proved to be more effective than any of the three nonhumorous control versions (circles). Of the controls, the solid line identifies the educational message proper (C), the short-segment broken line identifies the version that controls for the fast-paced insertion pattern (CF), and the long-segment broken line identifies the version that controls for the slow-paced insertion pattern (CS). (Adapted from Zillmann, Williams, Bryant, Boynton, & Wolf, 1980.)

FIGURE 3.

Visual attention to educational programs as a function of the involvement of differently paced humorous inserts. All effects parallel those on information acquisition (see Figure 2). The nomenclature of Figure 2 applies. (Adapted from Zillmann, Williams, Bryant, Boynton, & Wolf, 1980.)

MAKING CONTACT:
FORMATIVE RESEARCH IN TOUCH WITH CHILDREN

Keith W. Mielke
&
Milton Chen
Children's Television Workshop
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ABSTRACT

3-2-1 Contact is a television series designed to motivate interests in science and technology, especially among its target audience of children 8-12 years of age. Produced by the Children's Television Workshop (CTW), its 65 daily half-hour programs premiered January 14, 1980 on public television stations across the United States.

The formative research agenda paralleled the activities of the project as a whole, evolving through four stages of development: needs assessment, format development, test show production, and series production. During these four stages, more than fifty formative research studies were conducted, engaging the participation of more than 10,000 target audience children. Examples will be drawn from this program of formative research to illustrate how changing needs of decision-making in production and management call for responsive research designs and methods. Working in close coordination with content and production staffs, the formative research contribution consists not only of 'hard' data, but also of 'softer' impressions and judgements. Selected highlights and insights will be discussed from areas of research methodology, production attributes, and the nature of the target audience.

INTRODUCTION

This article will first discuss briefly a number of challenges posed in the course of planning and producing 3-2-1 Contact, and how our in-house developmental or formative research responded to project needs through its various phases. Subsequent sections will then summarize lessons we have learned

about research methods appropriate for the target audience of eight-to-twelve-year-olds and insights we have gained into their responses to television and science.

Over a decade ago, Children's Television Workshop (CTW) pioneered in the application of formative research to the production of goal-directed television programs. The idea was both simple and powerful: to provide feedback from the target audience while programs are still in their formative stages of development. The more novel or difficult the production task, the more useful such formative research feedback can be to project management. As with CTW's other children's series that preceded this one--Sesame Street and The Electric Company--the idea of producing a daily children's science series was both new and difficult.

For example, 3-2-1 Contact was the first of CTW's productions to be designed from the very beginning for dual home and school use, requiring simultaneous concern for both the child viewing voluntarily at home as well as the teacher structuring a lesson in the classroom.

The organization of the science content presented other fundamental issues. Science is everywhere: it can be seen in virtually every phenomenon and event. Criteria were required for the selection of science content. Policies and principles were needed for the structuring of this content for television treatment. Our aim was to organize the content coherently, but to avoid the formal and sequential nature of many classroom science curricula. The device of weekly themes (e.g., Hot/Cold, Noisy/Quiet) was attractive for its ability to cross traditional scientific disciplines, to encompass a variety of scientific 'big ideas' or principles, and to be exemplified through phenomena of interest to children.

On the receiving end of the programs, there stood a sophisticated and demanding audience of young television viewers, many of whom were involved in a process of declining interest in science. Didactic approaches and pedantic explanations would quickly alienate them. Production values would have to be competitive with those of popular commercial programming. In addition, the sheer magnitude of coordinating and producing 65 half-hour programs imposed its own requirements and constraints on production decisions.

PHASES OF RESEARCH

In order to be responsive to overall project needs, the formative research agenda paralleled the activities of the project as a whole. The project evolved through four stages of development, needs assessment, format development, test show production, and series production.

Needs assessment. During the earliest phase of needs assessment, formative research focused on questions such as:

What is the need for greater public understanding of science? How is this problem currently being addressed with children?

What is the status of science teaching in the elementary school?

What do surveys of science achievement indicate about children's knowledge of science? What are their prevailing attitudes towards science and technology?

FORMAT DEVELOPMENT

During the next phase, researchers joined producers, writers, and content experts in the crucial step of defining a format for the series. The research agenda expanded to include the conduct of actual field studies, evaluating a wide variety of existing and experimentally produced in-house material for questions such as:

What are the TV viewing preferences of the target audience of 8-12's?

What attributes affect the appeal and comprehension of science presentations with children?

What formats would be most appropriate for the science series?

What types of characters do children find appealing?

What are children's perceptions of scientists and the work of science?

TEST SHOW PRODUCTION

The most critical and comprehensive sets of studies were devoted to evaluating the test programs. For this effort, we employed a 'mosaic' approach, where multiple research designs were applied simultaneously. Data collected through one method were complemented by data from others so that a collective evaluative picture emerged. Four areas for investigations were:

What is the appeal of the various segments and cast members?

What points of information and overall concepts are more and less comprehensible to viewers?

What is the competitive appeal of the series in a home-viewing environment?

What is the series' potential for classroom utilization?

SERIES PRODUCTION

During series production, formative researchers functioned as representatives of the target audience in daily consultations with production and content staff, drawing on what was by that time an extensive accumulated knowledge of the reactions of the target audience. Selected programs from the first four weeks of the series were also evaluated in the field as they were completed.

In all, the formative research program comprised more than fifty field studies with over 10,000 target-age children. The following highlights draw upon those finds in summarizing what we have learned about formative research methodology and our target audience.

METHODOLOGICAL INSIGHTS

Look at the picture of each T.V. show. Put a circle around one of the cartoons across from each picture. When you have finished this page, there should be one circle for each T.V. show.



SIR MILLION DOLLAR MAN



ANIMALS, ANIMALS, ANIMALS

I HAVE NEVER
HEARD OF
THIS SHOW.



I KNOW ABOUT
THIS SHOW,
BUT DON'T
USUALLY
WATCH IT.



I WATCH
THIS SHOW
WHenever
I CAN.



DO NOT
WRITE
IN THIS
SPACE

46

47

Photos and graphics aid the responses of children to paper/pencil items

PAPER/PENCIL MEASUREMENT

Since 3-2-1 Contact had the oldest target audience of CTW's children's series, the formative research was able to make more use of questionnaires and other forms of paper/pencil measurement. However, the research staff saw a need to balance the greater economy of data collection from large groups with such instruments against requirements for quality control of the data, particularly among children at the younger end of the 8-12 age range. In this trade-off, some written instruments worked better than others.

One successful paper/pencil instrument was a questionnaire specially designed to measure children's TV viewing interests and habits. It was administered by teachers to over 4,000 children in nine regions around the country.

The questionnaire purposefully did not give the appearance of a school test booklet. Items were designed to be clear, simple,

repetitive in format, and enjoyable for the respondent. In one section on the awareness and viewing of 20 selected programs, attractive graphics helped overcome literacy problems among child respondents. Each show was identified by a photo of its main characters or logo, seen next to the program title. Response options were limited to three, identified both in writing and by stick figures that conveyed the meaning of the option.

POSITIVE RESPONSE BIAS

Children in this age range have discovered the social value of being able to infer behavioral expectations from parents, teachers, and other adults. This social skill frequently presents a problem for the television researcher by taking the form of a 'positive response bias', the hesitancy to say anything critical of the test materials in order not to appear discourteous.

We built in safeguards against such bias through research designs that legitimized the negative response and through constant awareness in the interpretation of results. For instance, our research teams were careful not to state that they represented CTW in working with children. To our surprise, many children were able to identify CTW's name and its programs and held favorable attitudes towards the organization. We stressed to children that we were not actually the creators of the material, so that they could feel free to offer criticism without concern for offending anyone present. We also went to considerable lengths to explain that candid and thoughtful reactions, positive or negative, were of the most value to us.

FORCED-CHOICE VS. SCALE ITEMS

Awareness of the potential for positive response bias has led to other preferences in methodology as well. For instance, we often evaluated sets of television segments or cast members. If a graduated scale were applied (e.g., a 5-point scale ranging from 'like a lot' to 'dislike a lot'), the respondent would be free to

give a high or favourable rating to each segment or character. Such behavior not only avoids the social risk of being negative, but also permits one to escape the responsibility of making judgemental discriminations and applying meaningful criteria.

Because of this tendency on the part of respondents, we have come to avoid graduated scales, and to prefer so-called 'forced-choice' questions such as: "From this set of three TV segments (or cast members), circle the one you liked best. Put an X through the one you liked least." Such procedures elicit a process of discrimination from the viewer, and legitimize the negative response by specifically asking for it.

PROGRAM ANALYZER

Controlling for positive response bias has also influenced our administration of a research technique known in its original form as the Stanton-Lazarsfeld Program Analyzer. CTW's early version consisted of 10 sets of two buttons, one for each hand, that could be activated by pressing while viewing a television program. One button was used to record a positive response to the ongoing program, the other button for a negative response. By recording exact moments when positive and negative responses were made, a profile of the response pattern, displayed across units of time, was matched against the program material to which it applied. Determining such peaks and valleys of appeal within a program is a typical and basic formative research assignment.

We had previously used such a device among adults, with good results. However, some adaptations were necessary for 8-12's. First, in instructing children to apply both positive and negative criteria simultaneously to test programming, the instructions became unduly complicated. Second, positive response bias was again apparent. Given a choice of responding either positively or negatively, many children responded with heavily positive voting across widely varying material.

Based on pilot testing of various response options, we decided on a variation that not only simplified instructions for the children, but also controlled for positive response bias. Half of each test group received only a positive response option: "Whenever the program is interesting to you or fun to watch, hold this button down; if you're not sure, don't press the button at all." For the other half, only a negative response option was offered: "Whenever the program is boring or not fun to watch, hold this button down; if you're not sure, don't press the button at all."

The result is two independent subgroups responding to a test program, one registering positive reactions, the other negative reactions. Often peaks in voting by the 'positive' subgroup are matched by valleys in voting by the 'negative' group, giving strong cross-validation of interpretable data.

In giving Program Analyzer instructions to children, we have learned to avoid the words 'like' and 'dislike', because children perceive dual meanings for those terms. On the one hand, a 'dislike' vote might mean that the material was boring and not engaging their interest. On the other hand, the test material could be quite interesting or compelling, but 'disliked' because viewers did not approve of the actions taken by the individual characters.

In using the Program Analyzer across a wide variety of materials, we have found the technique generally to be more successful at tracking the relative appeal of segments within a magazine format than across longer plotted dramas. Appeal profiles for dramatic presentations often built to a point where no further discrimination or changes in appeal were evident.

We hypothesized that, unlike viewing of a magazine format, the viewer of a plotted drama makes a different type of psychological 'investment'. Once the threshold of commitment has been

reached to stay with the program to its resolution, the viewer finds it more difficult to make moment-by-moment judgements of scenes whose full interpretation rests on the final denouement. With the shorter segments of a magazine format, judgements are more independent and instantaneous. Appeal profiles often change dramatically with transitions to different segments.

PROGRAM EVALUATION ANALYSIS COMPUTER (PEAC)

In the course of conducting formative research on 3-2-1 Contact, new improvements in the technology of the Program Analyzer methodology were developed. In conjunction with the Ontario Educational Communications Authority (OECA), we designed a portable, microprocessor-based system using an Apple micro-computer and 40 wireless hand units for respondents. The hand units are battery-powered and contain microprocessors that register responses from calculator-like key-boards.

Our new system, known as the Program Evaluation Analysis Computer (PEAC), offers major advantages over the previous system:

- Convenience of an attractive, self-contained hand unit for large-group testing.

- Potential for simultaneous use of up to 14 response keys.

- Ability of the hand units to log both moment-by-moment data as well as responses to multiple-options questions.

- Computing power of the microcomputer, which allows data from the hand units to be converted to a graph within minutes of final data collection, with options for analysis by subgroups. Minimizing turn-around time for formative results was crucial for impact on production decisions.

- Presentation of results in color graphics on a TV screen, synchronized to program content on a second screen. This advantage offers new possibilities for effective researcher-producer communication.

GENERALIZING FROM FINDINGS

Our formative research experience has also increased our sensitivity to stating generalizations from findings without appropriate cautions. Television production can have enormous variations in

the method of presentation for any single topic. The interaction of topic appeal and method of presentation thus makes it difficult to generalize.

Consider, for example, the question of whether snakes, as a general topic, are appealing to children. On one occasion, a short segment of a snake swallowing its prey was repulsive to children. On another occasion, similar footage, set in the context of predator-prey relationships surrounding a termite mound, was highly compelling, eliciting much discussion both during and after viewing.

Acknowledging the difficulty of stating generalizations that will apply across all cases, we attempt here to offer a series of insights that have emerged most frequently from our fifty studies and our sustained contact with the target-age group in the U.S.

GENERAL CHARACTERISTICS OF 8-12's

Television interests and preferences. Children of this age range are familiar with a broad range of TV programs, formats, and characters, spanning situation comedy, action/adventure, game shows, feature films, commercials. They are very articulate in discussing reaction and preferences. They hold high standards for production values, often stating the need for 'action' and 'good acting' and criticizing material that is 'corny' or 'silly'. The shorter attention span that characterizes younger children is less of a concern with this audience, many of whom regularly watch movies.

Given the range of programming viewed by this audience, they are in surprising agreement on their favorite shows. Our TV Interest Survey indicated that only seven programs, such as Charlie's Angels, Happy Days, and The Incredible Hulk, accounted for more than half of the unrestricted 'favorite show' nominations from more than 4,000 children.

SCIENTIFIC THINKING AND KNOWLEDGE

Children of this age tend to think in concrete terms and give literal explanations based on their own experiences with the visible physical world. They do not readily make abstractions. They are less familiar with the unseen world, such as molecules and microorganisms, as well as invisible larger processes, such as water and energy cycles. Therefore, in 3-2-1 Contact, careful attention was devoted to vocabulary and explanations. Prior knowledge on subjects that adults take for granted, such as the gas crisis or computers, cannot simply be assumed with children.

However, many children do have pockets of knowledge based on home, school, and TV experiences. They often have more grounding in the biological world of animals and plants than in the physical world of natural phenomena. Animal behavior and the human body are areas of high interest and curiosity.

SEX DIFFERENCES

Stereotypical sex differences have been found using multiple methodologies, both confirming the need for the series and indicating the difficulty of expecting to alter such attitudes on a large scale.

For instance, in our TV Interest Survey, girls were more attracted than boys to shows characterized by themes of warm human relationships, often in family situations, featuring women in lead roles. Boys showed a relative preference to action/adventure programs with male lead characters. In another study, girls preferred brief excerpts of animal films while boys preferred those with an outer space setting.

FACTORS AFFECTING APPEAL AND COMPREHENSIBILITY

High appeal of plotted drama vs. magazine format. Early studies demonstrated a clear preference for plotted drama over the

segmented magazine format as a general program type. The format where a problem is posed and resolved through relations between various recurring characters is a powerful device for attracting and holding viewers of this age. This trend continued in children's reactions to The Bloodhound Gang, which used this finding to advantage by posing mysteries solved by young detectives slightly older than the target audience. These mini-mysteries consistently have tested as the highest appeal element of the series. The challenge to researchers and producers is to investigate new ways of incorporating instructional content into the plotted drama format.

STRONG DOCUMENTARY STORYLINE

The appeal of plotted drama can be translated into documentary film segments as well. Often, the dramatic development of a problem and its resolution can help motivate the need for a scientific approach or piece of information. Children were particularly drawn to those documentary segments with emotional, life/death themes, for example, stories of endangered species or premature babies.

ACTIVE VISUALS

Children of this age appear to process information from television predominantly from the visual channel and secondarily from the audio. Unusual or action-filled pictures of phenomena were of high interest, such as those of the world's largest pizza or a massive oil spill. Material with static visuals, which relied heavily on the audio track to carry the informational load, were unappealing.

EXPLICIT CONNECTIONS BETWEEN SEGMENTS

Contrary to some initial hypotheses, children did not view as didactic a clear statement of educational 'headline' tying

together each day's segments. In fact, when such connective material was not present, viewers did not perceive any unifying theme and viewed the magazine format as an assortment of 'just a lot of different things'.

APPROPRIATE HUMOR

Eight-to-twelve-year-olds possess an appetite for humor. They look for opportunities to laugh while viewing, especially during animation, and are disappointed when their expectations are not fulfilled. They were quick, however, to label attempts at humor that were 'silly' or 'babyish'.

ROLE MODELS: COMPETENCE

In their reactions to characters, whether scientists or young people, children consistently favored those who 'did the most', 'knew what to do', or 'knew the answers'. This was often the definitive quality of scientists-their expert knowledge and behavior. In addition, viewers were especially drawn to other young people, both in dramatic roles and documentary films, who were striving to demonstrate competence. One girl's comment about Trini's venturing into a salt march captures this feeling: "Trini was doing a lot of things she's never done before. She was pretty brave to do 'em. Most girls wouldn't do that!"

YOUNGER ROLE MODELS

A series presenting career information may have a natural tendency to emphasize older role models who have demonstrated achievement in their fields. Children, however, favored younger adult role models of the target age or somewhat older, with whom they could identify more closely.

PRESENTATION OF SCIENTISTS

In their essays about scientists and responses to specific TV

portrayals, children held both positive and negative perceptions of scientists and the work of science. Over two decades ago, in a study published in 1957, Margaret Mead found a similar ambivalence toward scientists among high school students.

On the positive side, our target audience respected scientists for their expertise and contributions to humanity, especially for finding new cures for disease and inventing new things. However, many children did not see science as a personal or career interest. They saw it as intellectually difficult, requiring long training, and physically dangerous. Scientists were viewed as narrow human beings who spend their lives in labs and have little family or social life.

When children did say they wanted to become scientists, it was frequently to learn more about the human body. As one nine-year-old-boy wrote, "I would like experimenting with the brain and other organs of the body because sometimes I think of how marvelous we really are".

CONFIRMING THE APPEAL OF SCIENCE CONTENT.

As mentioned earlier, one fundamental issue faced throughout the development of the series was the presentation of science in ways that would maximize its appeal with children. In the early stages of the project, it was not clear whether the phenomena of science would make for compelling viewing by themselves or whether the commercial entertainment techniques of television, such as songs, comedy sketches, and stylized characters, would be needed to bolster the appeal of the content.

Formative research was able to illuminate this problem. Testing indicated that children appreciated the realistic, sometimes serious tone of many of the documentary films and that their eagerness to seek out information about the world around them co-existed with an appetite for dramatic conflict, fast-paced action, and situation comedy.

This finding led us to conclude that a science series could be built around young people conducting an earnest investigation of interesting phenomena, and this tone was ultimately adopted by 3-2-1 Contact. In providing this recommendation, formative research provided child-based support for a view shared by our staff scientists: that science content need not be minimized in order to be entertaining.

'Child-based' is the key insight into our formative research. Through formative research, the target audience child has an in-house advocate and a voice at the decision-making table. Both the process and the product of formative research have been valuable in developing 3-2-1 Contact. Both should be similarly useful to others who seek to combine entertainment and educational values in producing material for children.

Dr. Keith W. Mielke is Associate Vice-President for Research at CTW and Executive Director for 3-2-1 Contact. Milton Chen is Director of Research for 3-2-1 Contact.

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ASYMMETRY OF THE VISUAL FIELD:
PERCEPTION, RETENTION AND PREFERENCE OF STILL IMAGES

Nikos Metallinos

Temple University
Philadelphia, Pennsylvania

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ABSTRACT

This study examines the 'asymmetry of the field' theory insofar as viewers' perception, retention and preference for still visual images are concerned. The purpose of this experimental investigation is to determine whether or not the specific shapes, colors and placement of visuals within the picture frame affect viewers' abilities to perceive, describe and retain them, and whether or not such an asymmetrical composition is preferred.

It was found that (a) the viewers' ability to perceive and readily describe certain visuals within the left or right side of the visual field is greatly dependent on the shapes and color of such visuals; (b) the retention and recall of such visuals is more accurate when such visuals are unique in their shapes, outstanding in their colors, and probably when placed within the left visual field; and (c) the viewers' preference for the total compositional structure of still images is affected by the asymmetrical placement of the visual elements on the left-hand side of the visual field.

INTRODUCTION

While the verbal content (the aural message) of television newcasts has improved considerably, the visual content (the synthesis of the visual elements within the television screen) still maintains a stylistic form which is static, neutral, lacking visual dynamism and expression. Fearing possible viewer disturbance and, consequently, misunderstanding of the newscast

stories delivered, television news producers have overlooked the need to improve the visual content of newscasts. Still influenced by the journalistic point of view that the news stories should be delivered straight forward, television newscast producers have, in my view, ignored the basic axiom of television that the verbal content of the story should coincide with the visual content of the image. It has been repeatedly stated that the medium of television requires the presence and the harmonious co-existence of both sight and sound. The newscast picture's composition (such as framing, spacing of elements, background visuals, colors, sizes of visuals within the frames, etc.) should be compatible to the clarity, dynamism and syntheses of the news story. It is suggested, therefore, that there is an overt effect on television newscast viewers when the sounds (news stories) and the sights (frame's composition) are incompatible and unbalanced.

There are extensive empirical investigations on the verbal content, news credibility, broadcast news quality, effect of newscast content on viewers, delivery of the news on television cameras, etc. (Weinthal and O'Keefe, 1974; Stone, 1974). Studies concerning the visual content, the visual composition, the proper placement of the visual elements within the screen, the framing, balance, spacing, the use of background or symbolic visuals, etc., are limited (Mandell and Shaw, 1973; McCain et al, 1977).

In their study on the effect of left versus right placement of visual images in regular newscasts, Metallinos and Tiemens (1977) suggested that color, shape or form, size and directional lines (vectors) of the visuals are contributing factors effecting viewers' perception, recognition and retention of visual images. According to these authors:

"There are several factors which may have contributed to a viewer's perception of visual content and thereby influence the effect of asymmetry...Such factors as size, color, shape, vectors (directional lines), and how individual subjects perceive these qualities must also be considered."

These factors must first be examined before any conclusions can be drawn in regard to the correct placement of visual materials within the visual field. It is probable that Metallinos' and Tiemens' study on the asymmetry of the screen failed to support its hypothesis because such crucial factors as images size, color, shape, vectors, etc., were not accounted for.

It will be the province of this study to examine what effects these factors have on ordinary television viewers. Specifically, this study examines whether or not television viewers better perceive, retain and prefer still visuals in ordinary newscasts which are placed on the left side of the TV screen (news-casters's right) or the right side of the TV screen (news-caster's left), because of the particular shapes or forms, the specific colors, and the total composition of these still visuals. In other words: Do the shapes, the colors and total synthesis of still visuals within the left or right of the television screen effect viewers' perception, retention and preference of these visuals?

Psychological studies on the perception of visual images (Haber, 1968) and neurological studies on the distinct functions of the left and right hemispheres of the human brain (Ornstein, 1968) have contributed greatly towards our understanding of the composition of images. Scientific evidences provided by such psychological and neurophysiological studies, have shown that viewers do discriminate in their preferences of placement of visual materials within the visual field. The functions of

the two hemispheres of the brain are asymmetrical and different (Anderson et al, 1979). Trotter's (1976) study on the hemispheric specialization of the human brain concludes that the particular functions of the right hemisphere which controls the left side of the body are "spatial/musical, holistic, artistic, symbolic, simultaneous, emotional, intuitive, creative, minor (quite), spiritual, receptive, synthetic, gestalt, facial recognition, simultaneous comprehension, perception of abstract, pattern recognition of complex figures." Whereas the list of the particular functions of the left hemisphere, which controls the right side of the body, include "speech/verbal, logical, mathematical, linear, detailed, sequential, controlled, intellectual, dominant, worldly, active, analytic, reading, writing, naming, sequential ordering, perception of significant order, complex motor sequences." These two lists point out the various perceptual, cognitive and compositional factors regarding shapes, colors and total compositional preference of visuals by television viewers, and they are of immediate concern to this study.

Psychologists have observed how viewers perceive and recognize shapes, forms or patterns, starting with simple geometric figures (such as rectangles, circles, triangles, squares, etc.) and progress to more advanced, complex and ambiguous ones (such as multisided figures, three-dimensional objects, reversible figures, etc.) Depending on such key factors as (a) duration of presentation, (b) the development of the perceiving individual and (c) the individual's familiarity with the pattern (shape or form), the order of preference and recognition is triangle, circle, square, parallelogram, rectangle, etc. (Murch, 1973). This empirical evidence has been observed and stated by Taylor (1964) a renowned analyst of the Visual Arts and the famous Gestalt psychologist, Kaffka, both of whom have maintained that "the simpler and more stable the pattern, the more readily it is perceived and recognized." This implies that the extent to

which a viewer perceives, retains and observes the total synthesis of visuals within the field depends on the degree of simplicity of the particular visual. Consequently, a simple pattern (such as a circle), placed on the left visual field, could be perceived and recognized more readily than a more complex pattern (such as a rectangle) placed on the opposite side. The central concern of this study, however, is whether or not similar patterns (shapes or forms) are perceived and/or recognized more readily when they are placed on the left visual field rather than the right, as long as the rest of the visuals within the frame remain constant. Trotter's list of hemispheric specialization suggests that the perception of abstract patterns and recognition of complex figures (both of which are functions of the right hemisphere of the brain) are left side specializations. Can we infer, however, that such specialization and preference could be said for the left visual field of still pictures? This hypothesis needs to be tested.

Empirical studies on viewer's perception, retention and compositional preference of colored images are also extensive (Birren, 1962; Hurvich and Jameson, 1966). An interesting observation has been made by Arnheim (1969) who concludes that:

"Since shape and color can be distinguished from each other, they can be also compared. Both fulfill the two most characteristic functions of vision. They convey expression, and they allow us to obtain information through the identification of objects and happenings."

This relationship is also observed by Bloomer (1976) who states that:

"Context is the most influential frame of reference for color perception. A single swatch of color will seem brighter, duller, darker, or changed in hue by changing only the context in which the color is seen."

In evaluating the empirical findings on the subject of color preference, Arnheim concludes that color preferences are related to complex social and highly personal factors, which observe the experimentation and bias the results. He suggests that" . . . it might be preferable not to experiment with colors 'as such', but to relate them to specific objects as is done in the field of market research." The perception of colors, their retention, and their preference, have not been reliably determined. Consequently, viewers' perception, retention and preference for colors due to their placement within the visual field requires further testing. Numerous experiments conducted by such interested groups as physicists, paint manufacturers, artists, interior decorators, neurologists and, of course, psychologists, have been done (Hochberg, 1971) and the seemingly superfluous attempts by researchers have been summarized by Boynton (1971) as follows:

"Unfortunately, data from many studies, where global judgements of color preference have been obtained, seem meaningless. In the first place, because color is perceptually attached to objects we do not necessarily have a favorite color that transcends all circumstances; red may be fine for fire engines, but not for the livingroom wall. Second, colors typically exist in more than one part of visual space at a time. The appearance of a color depends upon its surroundings and so do color preferences."

Important differences in viewer perception, retention and preference of colors due to their left or right placement within the visual field were expected, and a hypothesis and a treatment testing such probable differences was deemed necessary in this study.

Comparing the effects of (1) full-background still visuals on the TV screen, versus no background visuals at all, and (2) corner screen location of visuals (opposite a live newscaster), as opposed to no visuals at all, Coldevin's (1978) studies on

television newscast strategy and Baggaley and Duck's (1974) studies on the effects of adding background, have revealed some very important conclusions focusing on the variables involving the present investigation. These studies confirmed the remarks made earlier regarding the need for better presentation of newscasts. According to Coldevin: "When location establishment static visuals are used to enhance a speaker's delivery (when he is positioned centrally), a full screen is a more effective background display strategy." Furthermore, these studies suggest that 'when symbolic presentations are used to enhance a news reader's delivery, a corner screen location is the more compelling background display strategy.' These studies did not, however, concern themselves with the asymmetrical placement of such still visuals and their preferred placement (left or right) within the visual field, which concern the present study.

Although the review of literature suggests that the left visual field is more appropriate for the presentation of visual information, there is a disagreement among constructors of visual messages regarding the asymmetry of the visual field.

To test the effects of placement within the visual field of still TV pictures on viewers' perception, the following hypotheses were tested:

1. Placement of visual elements on the right or left side of the visual field (still TV pictures) does not significantly affect viewers' ability to perceive and to readily describe their shapes (forms or patterns).
2. Placement of visual elements on the right or left side of the visual field (still TV pictures) does not significantly affect viewers' ability to perceive and to readily describe their colors.

3. Placement of visual elements on the right or left side of the visual field (still TV pictures) does not significantly affect the retention of visual content.
4. Placement of visual elements on the right or left side of the visual field (still TV pictures) does not significantly affect the viewers' preference of their general composition.

PROCEDURE

Four tests were prepared and administered to a total of 47 randomly selected subjects from basic communication classes at Temple University. The tests were administered successively to groups of 4-6 subjects at a time. A viewing room was set forth and prepared to meet the prerequisites in projection conditions, viewing distances, angles, image size, timing of visual display, etc. as suggested by Wilkinson (1970) and Mayer (1973).

The stimulus materials utilized to test null-hypothesis #1 (shapes of visuals), hypothesis #2 (color of visuals) and null-hypothesis #4 (general preference of visuals) consisted of 20 short stories in international, national and local news. Each slide captured the newscaster in a medium close-up while he was facing the camera. His image occupied either the left or the right of the visual field. The other side of the slide (opposite the newscaster) was proportionately balanced with the placement of visuals (specifically designed for this study) to illustrate (symbolically) the content of the news story. Consequently, the 20 different stories were symbolically illustrated with 20 different visuals (simple pictures, drawing, faces, objects, etc.) alternately placed on the left and right space of the visual field, keeping a series of variables

constant that would have distracted the viewers. (See Appendix A) The stimulus materials (Test Items) used to test viewers' retention (hypothesis #3) of the visual stimuli used in the previous tests consisted of 20 slides. Each slide containing five visuals, the visual originally used to symbolize the content of the news story and four additional ones (similar to the original), symbolically depicting the same story were randomly presented to the subjects. (See Appendix B)

The test for hypotheses #1 (viewers' perception of predominant/outstanding shapes and forms) was a multiple-choice one consisting of twenty-one items constructed from responses gathered by thorough pre-testing of all the possible shapes, forms of patterns contained in the visuals of the 20 slides. The image of the newscaster remained constant. Each slide was projected for 10 seconds with an interval of 15 seconds blank light to allow the subject to mark their choices. (See Appendix C)

The test for hypothesis #2 (viewer perception of predominant/outstanding colors) was also a multiple-choice one consisting of a total of nine possible items constructed from responses gathered by thorough pre-testing of all the possible colors contained in the visuals of the 20 slides excluding the colors of the background and the image of the newscaster which remained constant. (See Appendix D)

The test for hypothesis #3 (viewers' retention of the visual stimuli used in the news stories) provided five choices for each slide, one of which was the correct one. Each slide was randomly shown on the screen for ten seconds. Each subject was then asked to identify the visual from each slide that was used in the previous presentation. (See Appendix E)

The test for hypothesis #4 (testing the viewers' general preference for the total composition of the original 20 slides) consisted of the step preference scale ranging from 'don't like at all' to 'like very much'. (See Appendix F) Each slide was shown for ten seconds and subjects were asked to record their preferences.

A t test was used (in each for the four experiments) to test for significant differences between viewers' perception of shaper, colors, visual retention, and general preference for the total composition of visuals. The .05 level of confidence was pre-set as the level for rejecting hypotheses of no difference.

ANALYSES AND RESULTS

The t test result of 2.719 obtained from the first test was significant. Therefore, the hypothesis that the viewers' ability to perceive shapes (forms of patterns) is influenced by their placement on the right of left side of the television screen supported the theory of the asymmetry of the visual field. Table 1 shows the summary of the data obtained from the test of the first hypothesis.

A closer look at the results of this test as shown in Table 1 indicates the following:

1. The viewers' ability to percieve the visual content of a picture is closely related and dependent on the asymmetrical placement (left or right) of the visual within the field.

TABLE 1

The perception of predominant shapes (forms)

Test Item	Visual Placement	Shape	Left	Right
1	R	two circles/isometric	-	13
2	L	two circles	27	-
3	L	two circles/concentric	4	-
4	L	circles/other	19	-
5	R	other/circles	-	17
6	R	map-like	-	38
7	L	other/ambiguous	6	-
8	R	human-like	-	29
9	R	map-like/human like	-	20
10	L	map-like/other	16	-
11	L	other/ambiguous	9	-
12	R	map-like	-	39
13	R	other/rectangle	-	1
14	R	rectangle/other	-	20
15	L	rectangle/undecided	17	-
16	L	circle	42	-
17	R	circle	-	17
18	L	circle/other	12	-
19	L	other/rectangle	16	-
20	R	rectangle	-	8

$$\frac{t_{46} = 0.957}{0.352} = 2.719 \text{ significant at the .01 level}$$

2. The simpler the visual display (the form, shape or pattern), the more readily it was perceived and recorded by the viewers. Map-like, human-like, single circles (test items #6, 8, 12 and 16 respectively), regardless of their left or right placement within the visual field, were perceived by the greatest majority of the subjects. Complex visual forms might be more interesting compositionally, but they are not readily perceived by viewers. See, for example, test items #3, 7, 11, 13 and so on.
3. The degree to which the symbolic presentation of a news story, an event, an idea, or an institution is successfully perceived and readily described by the viewers depends on the viewers' ability to identify the visuals (the symbolic illustration) in terms of its relationship to a known geometric figure. For example, test item #3 (symbolizing world peace), #7 (symbols of the Democratic and Republican parties), #11 (taxation in the USA), #13 (Utah's development of energy sources), and #20 (liquor laws and control of the state of Utah) are more or less known symbols, commonly used or easily identifiable by the adult viewer. However, they do not constitute a specific/known, and simple geometric figure, and that might be a reason for their low score.

The t test result of 4.475 obtained from the second test was significant at the .001 level. It confirmed the hypothesis (#2) that the viewers' ability to perceive certain colors more readily and distinctively due to the right or left placement within the picture frame. Table 2 shows the summary of the data obtained from the test of the second hypothesis

TABLE 2

The perception of predominant colors

Test Item	Visual Placement	Color	Left	Right
1	R	yellow/white	-	26
2	L	yellow/white	15	-
3	L	yellow/white	36	-
4	L	white	2	-
5	R	black/blue	-	36
6	R	brown/yellow	-	25
7	L	brown/white	4	-
8	R	mixture/blue	-	16
9	R	white	-	5
10	L	yellow	18	-
11	L	white	10	-
12	R	white/red	-	24
13	R	yellow/green	-	32
14	R	yellow/green	-	29
15	L	yellow	24	-
16	L	white/blue	20	-
17	R	blue	-	19
18	L	yellow/green	22	-
19	L	brown	29	-
20	R	brown	-	32

$$t_{46} = \frac{1.340}{0.253} = 5.296 \text{ significant at the .001 level}$$

Although the subject of color perception and description by the viewers is complex, a close look at the results of the second test (Hypothesis #2), shows the following:

1. One distinctive color, rather than a mixture of hazy, unclear colors is better perceived by the viewers.
For example, test item #3 (clear yellow and white), #5 (distinctive black and blue), #13 (sharply defined yellow and green) #19 (only clear brown) and #20 (also clear brown) scored high whereas test item #4 (hazy off-white), #7 (brown and white) and #9, 10 and 19 (unclear, indistinguishable white) scored very low.
2. Since this study did not use a control group to test for viewer preference of colors within the left and right sides of the visual field, no conclusion can be made as to whether or not reds (for example) are perceived better when they are placed on the left side of the screen rather than the right.
3. Although the subjects were asked to identify the outstanding, predominant colors of the slides, it is probable that the significant differences found (by rejecting hypothesis #2) is due to the visuals' shapes and contents which is so closely related to their colors. More tests are needed in this area.

The t test results of 2.458 obtained from the third test was also significant at the .02 level. It confirms the hypothesis (#3) that viewers will retain the visuals placed on the left side of the screen better than those placed on the right.

Table 3 shows the summary of the data obtained from the test of the third hypotheses.

TABLE 3

The retention of visuals

TEST ITEM	VISUALS PLACEMENT	LEFT	RIGHT
1	R	-	38
2	R	-	35
3	L	34	-
4	R	-	38
5	L	42	-
6	R	-	41
7	L	47	-
8	L	31	-
9	R	-	33
10	R	-	36
11	R	-	7
12	L	41	-
13	R	-	38
14	L	35	-
15	L	25	-
16	L	33	-
17	L	44	-
18	R	-	43
19	R	-	19
20	L	21	-

$$t_{46} = \frac{0.553}{0.225} = 2.458 \text{ significant}$$

at the .02 level

Retention and recall of visual stimuli is also a complex process, and, for the most part, hidden. Most of our recall and retention is due to some mechanism of the unconsciousness of which viewers are not always aware and responsible (Sherwin, 1980). The more complicated the visual display, the more complex is its process of retention. The results of hypothesis #3 indicate the following:

1. Regardless of their left or right placement within the visual field, those shapes and forms which are peculiar, different, unique, unusual, seem to be more readily recognized. For example, test items #5, 17, and 18 (see Appendix B) have a very high score.
2. Visuals with color (along with their unusual shapes) which are different and distinctive are better retained and more readily recalled. For example, see test items #6, 7 and 12.
3. The total score of retention of visuals placed on the left side of the visual field is greater than the total score of those placed on the right (L = 362, R = 328).

The t test result of 3.932 obtained from the fourth test was also significant at the .01 level. It confirmed the hypothesis that viewers preferred the composition of those slides in which the visuals appeared on the left. Table 4 shows the summary of data obtained from the test of the fourth hypothesis.

TABLE 4

Total compositional preference of still visuals

TEST	VISUAL	LEFT	RIGHT
1	R	-	204
2	R	240	-
3	L	299	-
4	L	156	-
5	R	-	194
6	R	-	203
7	L	104	-
8	R	-	205
9	R	-	275
10	L	243	-
11	L	236	-
12	R	-	243
13	R	-	173
14	R	-	174
15	L	229	-
16	L	347	-
17	R	-	265
18	L	247	-
19	L	189	-
20	R	-	196

$$t_{46} = \frac{5.255}{1.729} = 3.039 \text{ significant at the .01 level}$$

The individual scores shown in Table 4 indicate that the viewers' clear preference for asymmetrical rather than symmetrical composition is apparent. More importantly, the scores in Table 4 suggest that the placement of visuals illustrating the content of the story (narrated by the announcer) on the viewer's left is preferred as a general composition. With great consistency, the subjects scored those slides whose visuals were on the left higher than those slides whose visuals were on the right (see, for example, test items #2, 3, 10, 11, 15, 16, and 18). Equally, the sum-total of the scores of the slides where visuals were placed on the left was 2190 as opposed to 2152 on the right.

CONCLUSIONS

Within the limits of this study, the following conclusions can be drawn:

1. Viewers' perception of certain shapes, forms or patterns of visual stimuli is affected by their asymmetric placement within the left or right-hand side of the visual field.
2. Viewers' perception of certain colors of visual stimuli is affected by their asymmetrical placement within the left or right-hand side of the visual field. However, the precise placement of such colors within the left or right sides of the visual field remains unresolved.
3. Viewers' ability to retain the shapes and colors of visual stimuli depends on (or is affected by) their asymmetrical placement within the left visual field.

4. Viewers' preference for the total compositional structure of still images is affected by the asymmetrical placement of the visual elements on the left or right-hand side of the visual field.

A comparative study which would utilize a control group to test the viewers' perception, retention and preference of the same visuals alternating sides within the visual field is warranted.

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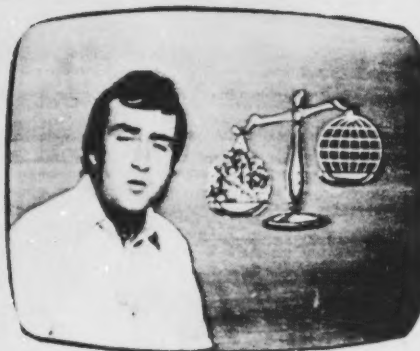
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-

Dr. Nikos Metallinos is Assistant Professor of Communications at Temple University, Philadelphia, Penn., and Visiting Professor in Communication Studies at Concordia University, Montreal.

APPENDIX A
STILL VISUALS (NEWS STORIES)

TEST ITEM (NEWS STORY) #1



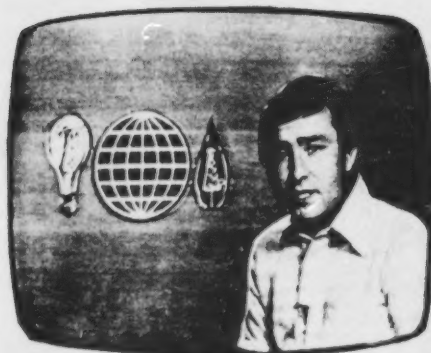
TEST ITEM (NEWS STORY) #2



TEST ITEM (NEWS STORY) #3



TEST ITEM (NEWS STORY) #4



TEST ITEM (NEWS STORY) #5



TEST ITEM (NEWS STORY) #6



TEST ITEM (NEWS STORY) #7



TEST ITEM (NEWS STORY) #8



TEST ITEM (NEWS STORY) #9



TEST ITEM (NEWS STORY) #10



TEST ITEM (NEWS STORY) #11



TEST ITEM (NEWS STORY) #12



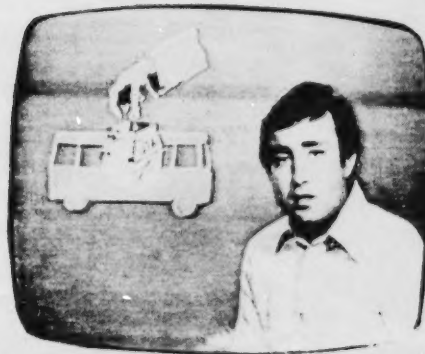
TEST ITEM (NEWS STORY) #13



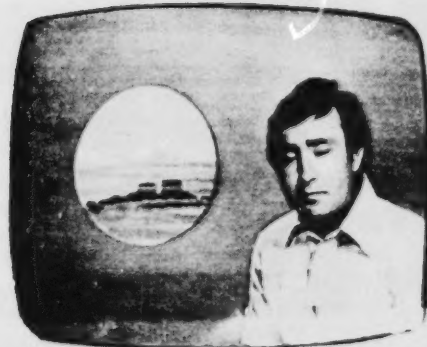
TEST ITEM (NEWS STORY) #14



TEST ITEM (NEWS STORY) #15



TEST ITEM (NEWS STORY) #16



TEST ITEM (NEWS STORY) #17



TEST ITEM (NEWS STORY) #18



TEST ITEM (NEWS STORY) #19



TEST ITEM (NEWS STORY) #20



APPENDIX B
MULTIPLE VISUALS (FIVE VISUALS EACH)



Test Item #1
News Story #12



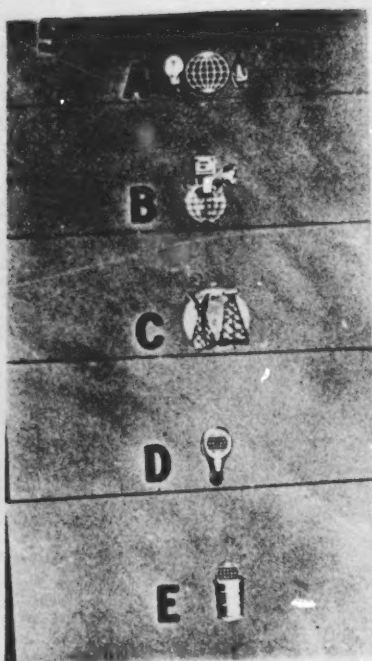
Test Item #2
News Story #14



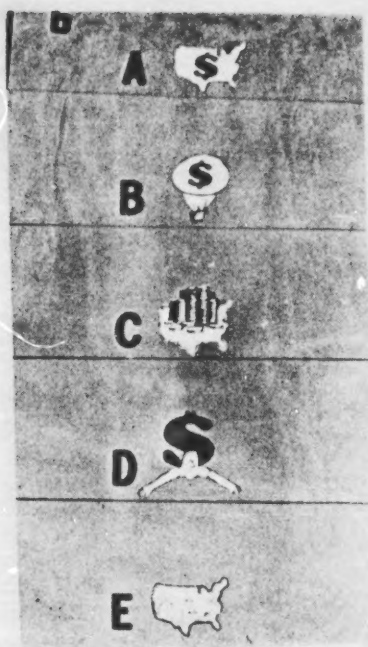
Test Item #3
News Story #18



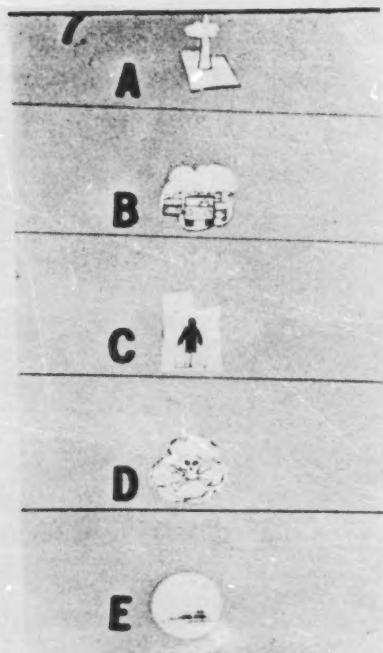
Test Item #4
News Story #9



Test Item #5
News Story #4



Test Item #6
News Story #6



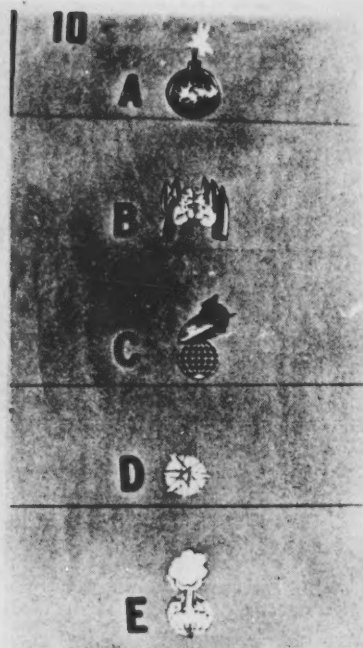
Test Item #7
News Story #16



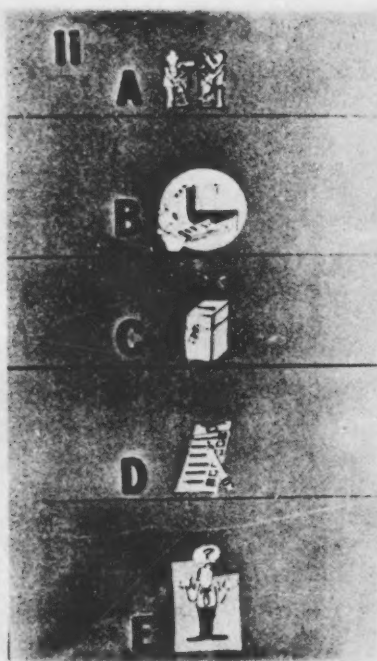
Test Item #8
News Story #11



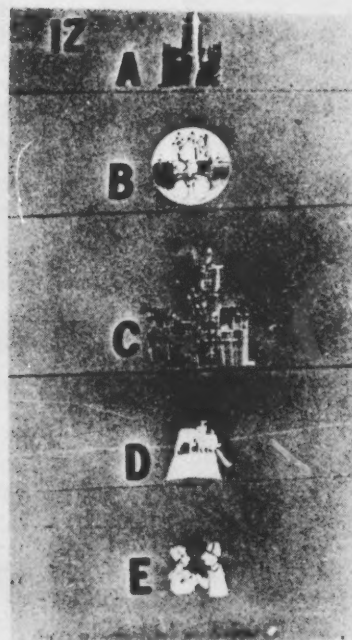
Test Item #9
News Story #8



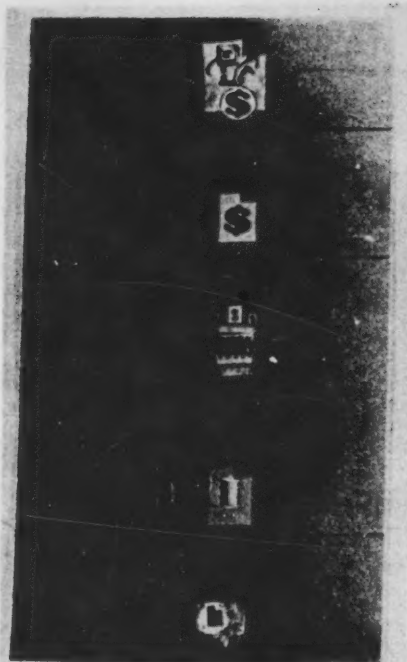
Test Item #10
News Story #5



Test Item #11
News Story #17



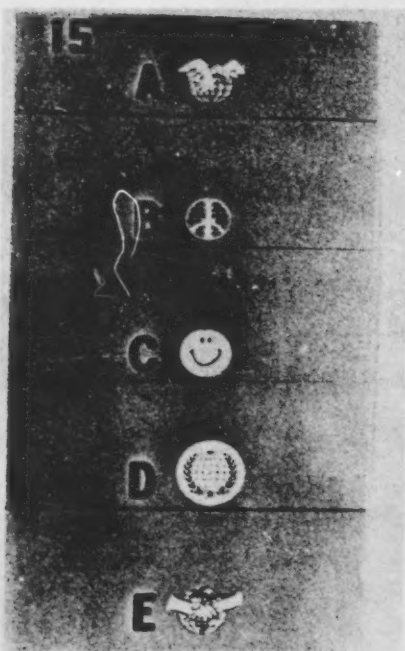
Test Item #12
News Story #19



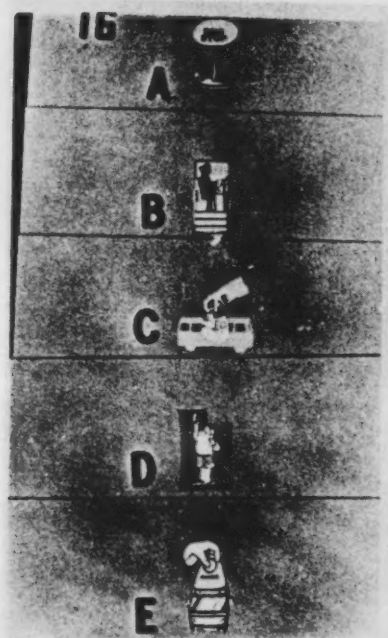
Test Item #13
News Story #13



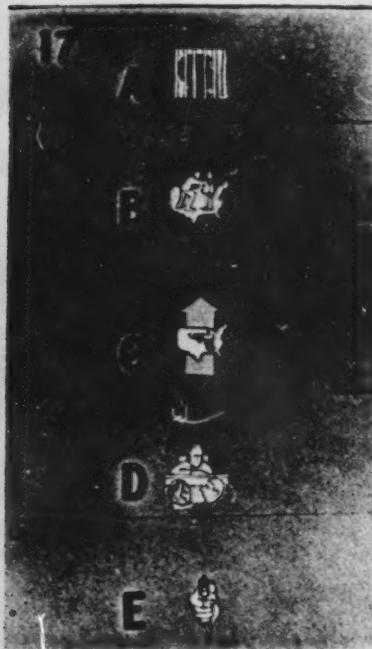
Test Item #14
News Story #7



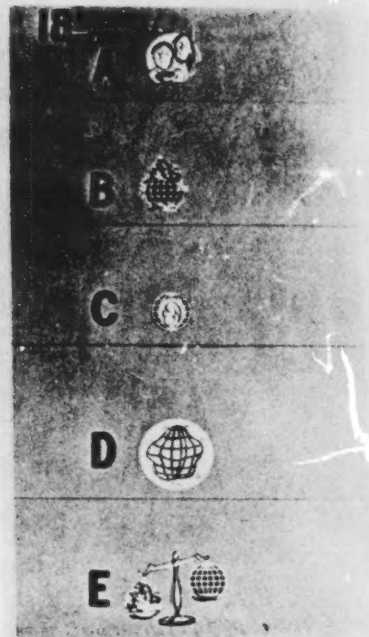
Test Item #15
News Story #3



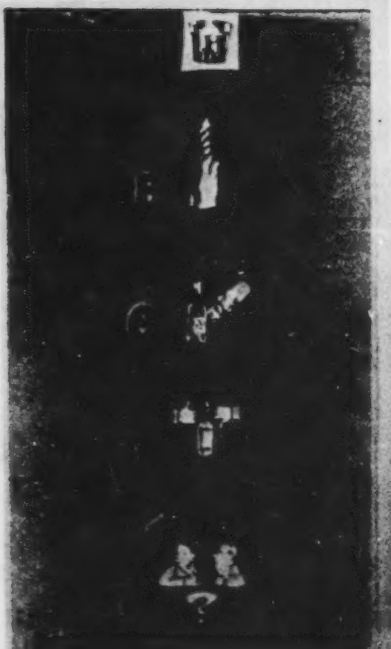
Test Item #16
News Story #15



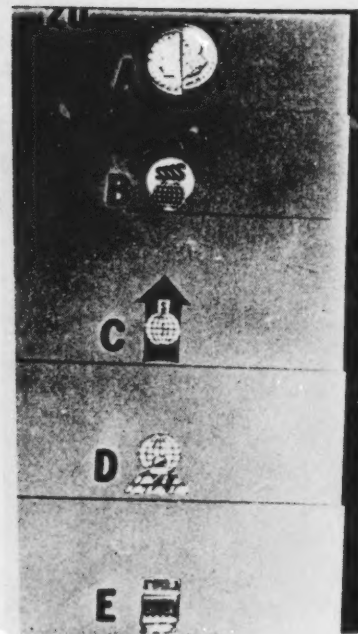
Test Item #17
News Story #10



Test Item #18
News Story #1



Test Item #19
News Story #20



Test Item #20
News Story #2

APPENDIX C
MULTIPLE CHOICE TYPE TEST (HYPOTHESIS #1)

DIRECTIONS

You will see twenty (20) slides each consisting of an illustration/graphic and an announcer. Select the shape that appears to you to be the most important (predominant or outstanding) in each illustration/graphic by placing an "X" in the appropriate box. Be sure to mark each of the twenty (20) slides.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
MAP-LIKE																					MAP-LIKE
HUMAN-LIKE																					HUMAN-LIKE
CIRCLE																					CIRCLE
(2) CIRCLES																					(2) CIRCLES
(3) CIRCLES																					(3) CIRCLES
ISOMETRIC CIRCLES																					ISOMETRIC CIRCLES
CONCENTRIC CIRCLES																					CONCENTRIC CIRCLES
SQUARE																					SQUARE
(2) SQUARES																					(2) SQUARES
(3) SQUARES																					(3) SQUARES
TRIANGLE																					TRIANGLE
(2) TRIANGLES																					(2) TRIANGLES
(3) TRIANGLES																					(3) TRIANGLES
RECTANGLE																					RECTANGLE
(2) RECTANGLES																					(2) RECTANGLES
(3) RECTANGLES																					(3) RECTANGLES
ELIPSOIDAL																					ELIPSOIDAL
AMBIGUOUS FIGURE																					AMBIGUOUS FIGURE
NON-IDENTICAL																					NON-IDENTICAL
OTHER																					OTHER
UNDECIDED																					UNDECIDED

APPENDIX D

MULTIPLE CHOICE TYPE TESTS (HYPOTHESIS #2)

Please select the color that appears to be most important (predominant or outstanding) in each graphic illustration, (excluding the newscaster) by placing an "X" in the appropriate box. Be sure to mark each of the twenty slides.

SLIDE #	1	2	3	4	5	6	7	8	9	10	
Black											Black
White											White
Red											Red
Blue											Blue
Green											Green
Yellow											Yellow
Orange											Orange
Brown											Brown
Mixture											Mixture

SLIDE #	1	2	3	4	5	6	7	8	9	10	
Black											Black
White											White
Red											Red
Blue											Blue
Green											Green
Yellow											Yellow
Orange											Orange
Brown											Brown
Mixture											Mixture

APPENDIX E
VISUAL RETENTION TEST

DIRECTIONS

From among the five illustrations contained in each of the slides you are now about to see, check the one you think was used in the previous test. Please check only one illustration by circling the corresponding letter.

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. A | 2. A | 3. A | 4. A | 5. A |
| B | B | B | B | B |
| C | C | C | C | C |
| D | D | D | D | D |
| E | E | E | E | E |
| | | | | |
| 6. A | 7. A | 8. A | 9. A | 10. A |
| B | B | B | B | B |
| C | C | C | C | C |
| D | D | D | D | D |
| E | E | E | E | E |
| | | | | |
| 11. A | 12. A | 13. A | 14. A | 15. A |
| B | B | B | B | B |
| C | C | C | C | C |
| D | D | D | D | D |
| E | E | E | E | E |
| | | | | |
| 16. A | 17. A | 18. A | 19. A | 20. A |
| B | B | B | B | B |
| C | C | C | C | C |
| D | D | D | D | D |
| E | E | E | E | E |

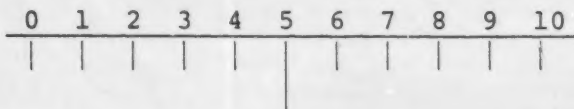
APPENDIX F

TEST STEP PREFERENCE SCALE (HYPOTHESIS #4)

DIRECTIONS

Now, we will look again at the original twenty (20) slides.
Using the scale, write a number in the box for each slide
indicating how much you like the general composition of the
slide as a whole.

DON'T LIKE
AT ALL



LIKE VERY
MUCH

SLIDES
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

SLIDES
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

DEVELOPMENT OF VISUAL LITERACY
IN CHILDREN

Claudette Davis
Cambridge University
England

DEVELOPMENT OF VISUAL LITERACY
IN CHILDREN

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ABSTRACT

This study aims to investigate whether meaning in film and television broadcasts is conveyed by the story alone, or whether it is the visual devices that create or add meaning to the content. If it can be shown that visual devices create their own meaning, then it would appear that one requires film or television literacy to understand fully film or TV broadcasts in which such devices are used. Furthermore, the study aims to investigate at what age children acquire an understanding of the TV conventions to which the visual devices are presumed to relate.

Three films are compared. The first employs dissolves between shots to create special effects, the second utilizes cuts, and the third makes use of one camera to follow the story. The content of the films is kept constant and consists of a child and clown interacting.

The subjects are 80 British and 80 South African children, ranging in age from 4½ to 8½ years. Each child is shown one film and tested thereafter by being asked to i) relate what he/she has seen, ii) answer questions about the content.

It is hypothesized that children who view the first film (using dissolves) will interpret the content differently to those children who view the other two films. It is also hypothesized that younger children will interpret all three films in the same way, whilst the older children will interpret the first film quite differently from the other two films.

Results from a pilot study indicates that the first hypothesis is generally supported. The sample was too small to show whether age differences were an important factor affecting interpretations. Further results should have implications for the optimal use of visual devices in children's programmes.

The director uses visual devices in television productions to create artistic effects. He calls "dissolve" when the content seems lyrical and poetic and when the cut has been overused in a sequence. Intuitive feel and experience in TV and film direction lead him to associate specific visual devices with certain emotions, or spatial or temporal changes. Very often he uses the devices in new perhaps idiosyncratic ways and becomes noted for an avant garde mode of direction.

The question arises as to how his viewers interpret his direction of the film. Many adults and older children understand most of the directors intentions because they have been exposed to so many films with visual devices before. However a considerable number may not extract the film interpretation intended by the director as noted by Jacquinot (1979) - one must "avoid the naive belief that....what I want to say....what I am saying is... what all readers understand " me to be saying. (p. 186)

The investigation into perceived meaning becomes even more complex when one considers how a viewer (assumed to be an adult here) understands and interprets his first film or television broadcast. He is faced with a range of juxtaposed images and interwoven fades, dissolves, cuts and supers. The question is whether his sole means of understanding the film is through the content presented in the rapid succession of images or whether the visual devices play a significant role in this process.

The purpose of this research is thus to investigate whether meaning in film is conveyed by the story alone (without special visual devices) or whether it is the visual devices that create or add meaning between shots.

If it can be shown that visual devices create their own meaning then it would be instructive to test whether the director's intended meaning is perceived as such by the viewer and whether in general one requires film or television literacy to understand fully film or television broadcasts in which such devices are used.

According to Metz (1974) one understands the syntax of films (such as the zoom, pan, dissolve) because one understands the film narrative. He notes that the force of the plot is always understood well, and from an understanding of the continuous images we will understand the dissolve or fade, if not in the first film, then in the third or fourth. In this way, plot or story narrative is primary and visual devices secondary to an understanding of the film.

On the other hand Salomon (1974) whilst never claiming that the story is unimportant in initiating televisual literacy, de-emphasises the content of the story and focuses on the symbol system of which television syntax is a part. According to Salomon one acquires an understanding of film or television syntax from exposure to their visual devices, and that the fade or dissolve carry their own meaning, which will affect an understanding of the content of the story. It is therefore necessary to be television literate (through an understanding of the symbol system of television) in order to fully appreciate televised content.

Hartley and Fiske (1977) contend however that television (and possibly film) is an oral medium in contrast to the literate media of books and newspapers. Television appeals to a subordinate class, in their view, because it does not require an understanding of its syntax as a prerequisite. One can understand television (or film) from simply watching it, they maintain.

From this point of view there is no need to investigate television literacy since it does not exist. Support for this contention appears in studies by Krugman (1971, 1976) who found that the brain activity of reading is more extensive than that of television viewing. It may thus be implied that the pictorial system of television calls for shallower cognitive processing than a written story or a verbally related one (Salomon, 1979). Nevertheless, one cannot rule out the need for television literacy from this implication.

Indeed, Salomon (1972) has noted that non-western cultures initially find difficulty in understanding the language of television and that only after constant exposure to this medium and their own film making can they learn to understand these film techniques. From this point of view, there is certainly a need to investigate film and television literacy.

It can be argued however, that television literacy need only be taught consciously to a culture unaccustomed to western pictorial presentations and not to a westernised lower class who have had some exposure to picture story books, comics or posters and who are thus familiar with the kinds of images presented to them on television. It appears though, that young westernised children may also face difficulties related to film or television literacy. According to Noble (1976) young children come to understand the content of film and television stories as they grow older, but have limited understanding of the continuity of plot in their early years.

An interesting question arises as to whether young children learn to understand the fade, dissolve and so on only after learning to comprehend the whole story or whether they learn the meaning of the visual devices as part of their perception of the small segments. If the former contention holds, Metz's (1974) theory of the force of the plot is sustained. However, if the latter proposition is correct it is possible that the devices are being cognitively stored in spite of the content, although the effect of

the content may not be ruled out. In partial support of the letter argument, Huston-Stein and Wright (1977) found that younger children attend more to single formal formats (such as the visual and auditory effects) and older ones pay more attention to the content. Older children soon come to regard the devices as syntactic markers which serve best in the interpretation of the meaning of the content.

In the light of the above, it is important to investigate the age at which children acquire an understanding of the devices and the way in which such comprehension is gained. In order to test whether visual devices create special meaning in a story, the following films are compared.

- 1) A film which depends on visual effects to create special meaning.
- 2) A film in which the simplest visual devices are used to limit added meaning.
- 3) A film which simply follows the story (by means of one camera) without any consciously imposed devices.

The film theme is briefly the following:

A child draws a picture of a clown - a clown appears to the child - together they perform a few tricks - the clown disappears - the child looks disappointed but returns to his drawing.

Film 1 uses a series of dissolves in changing from scene to scene to create a dreamlike atmosphere.

Film 2 uses cuts in the change between scenes to limit added meaning.

Film 3 uses one camera to follow the action to limit added meaning further and create the effect that the clown appears in reality to the child.

DESIGN

The subjects are 80 British and 80 South African children ranging in age from 4½ to 8½ years who will be divided into four age groups (40 per group with a 20/20 split between British and South African). The age groups are the following:

- | | |
|---------------------------------|---------------------------------|
| 4 yrs 6 mnths to 5 yrs 5 mnths; | 5 yrs 6 mnths to 6 yrs 5 mnths; |
| 6 yrs 6 mnths to 7 yrs 5 mnths; | 7 yrs 6 mnths to 8 yrs 5 mnths; |

Each age group is to be divided according to socio-economic sex, and IQ.

PROCEDURE

Each child is shown a television film and tested thereafter by being asked to relate what has been seen, and to answer questions about the content.

TABLE 1
Responses to questions (children)

Subjects	Dream	Make-believe Magic	Reality Walked in/out	Other
4 yr. 1		1		
olds 2			4d	
3				
5 yr. 4		3A		
olds 5		4d		
6				
6 yr. 7		3A		
olds 8			4d	
9			4d	
7 yr. 10		3A		
olds 11		3A		
12			I	
8 yr. 13	I			
olds 14		I		
15			4d	
16	3A			

TABLE 2

Total viewing frequencies

	F
I was viewed as a dream	1
I was viewed as magic	2
I was viewed as reality	1
3A was viewed as a dream	0
3A was viewed as magic	5
3A was viewed as reality	0
4d was viewed as a dream	0
4d was viewed as magic	1
4d was viewed as reality	4

KEY

I = dissolve sequence
3A = cuts sequence
4d = one camera view

RESULTS

In considering the comparative effect of the three sequences, the content of each has to be critically examined since it is crucial that content is kept constant throughout. In the first sequence (I) the clown walks on through the dissolve to meet the child an image which could signify that the clown appears realistically rather than in a dream. It is thus possible that the content of this film could have an overriding effect on interpretations leading to subjects responding that the clown appeared in a real way. However, as may be seen from Tables I and 2 above, out of four subjects one indicated that the clown appeared in a dream, two indicated that the clown appeared in a make-believe or magical way and only one subject considered that the clown's appearance was a real life experience. Thus three out of four subjects indicated that the clown seemed to appear magically or in a dream and thus it would seem that the dissolve has contributed to an interpretation of the content.

In the cuts sequence (3A), the clown is not viewed walking onto the set (as in I above) but is suddenly seen sitting next to the boy (after a cut from the boy lying on the floor). This sequence which was shown to five subjects was found to signify the magical appearance of the clown by all the subjects.

There was no other interpretation of this film, which might be seen to have come about through the effect of the content alone, and one cannot make any inferences about the effect of the cut here.

In the one camera sequence (4d) the content shows the 'walking boots' of the clown appear before the camera moves onto a full view of the clown. This image may be viewed as a sign that the clown has walked into the room in a realistic way. This sequence has greatest content similarity with the dissolve sequence. As can be seen from Tables I and 2, sequence 4d was interpreted by one out of five subjects as being magical in quality, whilst four

out of five subjects considered that the clown appeared in a realistic manner (ie. that he walked into the room and was not dreamt up or magically invoked). It thus appears that the one camera view presented a realistic interpretation of the sequence.

From the above analysis it may be seen that results of viewing the dissolve sequence and one camera view may be compared since the content of these films has closest interpretation similarity. This comparison shows that the dissolve has had the effect of influencing an interpretation of the content. However, the cuts sequence cannot be satisfactorily compared with the other two sequences (since as has been shown content is different).

The sample was too small to show whether age differences were important in the interpretations of each sequence.

DISCUSSION

The purpose of this study was (and is) to investigate whether meaning in film is conveyed by the story alone, or whether it is the visual devices that create or add meaning to the story. The rationale guiding the study was that if it could be shown that the visual devices create their own meaning, then it was felt that one would require an understanding of these devices in order to fully understand other film or television broadcasts in which such devices would be used.

The results indicated that interpretations of the content were quite different when dissolves were directed into the script or when one camera recorded the events without consciously imposing any visual devices. It will be important to see if these results are sustained during the study. However, whilst the visual devices seemed indeed to affect the content interpretation it may not be assumed that the devices have their own intrinsic meaning outside

the context of the content of the film. The content thus seems to provide the denotative element on the basis of which the connotational devices are imposed. The content without the device will not yield the intended meaning, but the device out of a meaningful context will probably not yield any meaning either. These results do point the way for further study in examining the effect of the dissolve in a totally arbitrary montage of images.

The second aim of the study was to investigate the ages at which children acquire an understanding of the visual devices. Although the sample was too small to yield any meaningful results, it is possibly in this investigation in the main study, that it will become clearer to what extent content influences the understanding of the devices and the earliest age at which the dissolve is a critical literacy component.

Another important variable to be considered is the cross-cultural one. Results from testing South African sample who have only been viewing TV for four years might yield differences in respect of acquisition and understanding of television literacy.

IMPLICATIONS

Results of this experiment should be of use to television producers or directors in indicating the ages at which the directors intended meaning is best understood. On this basis future research should be extended to establish a hierarchy of devices based on their ease of understanding at each age level. Such a hierarchy would be of importance in instructional programmes since directors would be able to choose those visual devices that would be best understood by their intended viewers.

Although this application might appear restrictive to individual learners who would be able to comprehend devices above their age level on the hierarchy, this need not be the case. Directors would still be able to use their discretion in their choice of devices, but would be able to use the hierarchy to guide the portrayal of certain teaching content in the best possible way.

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Mrs. Claudette Davis is a graduate student in the Department of Education at Cambridge University, England.

'CHANNEL 7' IN TRINITY:
AN EXPERIMENT IN NARROWCASTING

Charles Callanan
Extension Media Unit
Memorial University of Newfoundland

'CHANNEL 7' IN TRINITY:
AN EXPERIMENT IN NARROWCASTING

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ABSTRACT

The potential of small transmitters in educational and community development is currently exciting international interest. Memorial University's Extension Media Unit has the technology to set up a small broadcast television operation and to broadcast or "narrowcast" television signals through the air up to a range of 15 or 20 miles. The Trinity experiment was an attempt to field-test our Channel 7 transmitter and to experiment with various kinds of pretaped and live programming. The basic objective of the experiment was to explore the possibility of an 'on air' mobile TV station for possible educational ventures in the future.

The Conference presentation illustrates this experiment and draws the following conclusions:

1. It is possible and even relatively easy to set up a television station in rural Newfoundland or Labrador and to broadcast excellent quality signals into local homes.
2. It is possible to attract an audience in a very short time by the novelty of a local originated TV station so that most residents switch to Channel 7 and keep the station tuned for fear of losing out on something new or unexpected.
3. The telephone, in conjunction with the TV station, provides an instant source of communication between broadcasters and audience and has great potential as part of an educational process. People seem to be pretty free in using the phone and talking to people at the station.

4. When it comes to producing local programmes about local people the high interest of viewers far out-strips the need to produce slick television because people do not seem to be able to distinguish raw footage from edited material. This makes speed in production possible and it makes the television event more immediate.
5. This system of running a TV station in a very informal way helps to demythologize regular broadcast television, and it puts local people in a position of suggesting programmes and participating in the actual production.
6. People respond extremely well to entertainment, especially music, and more serious or educational material can be interwoven with light fare to educate audiences in various content areas.

THE NATURE OF THE EXPERIMENT

For some time now the Media Unit has possessed the technology to set up a small broadcast television operation and to broadcast or narrowcast television signals through the air up to a range of fifteen or twenty miles.

Up to this point the technology has never been tested in a field situation. The Trinity experiment was an attempt to field test our Channel 7 transmitter and to experiment with various kinds of pre-taped and live programming. The basic objective of the experiment was to explore the possibility of an on air mobile TV station for possible educational ventures in the future.

The technology required for this operation is already in the Media Unit. For live or pre-taped on-air transmission, the following technology is required:

- a) A transmitter
- b) An antenna
- c) Two video tape decks #1800
- d) A switcher
- e) One Shure audio live mixer
- f) One video camera (for live feeds)
- g) Two microphones
- h) A light kit
- i) Assorted connecting cables
- j) Two video monitors
- k) A supply of videocassettes

This is the basic amount of equipment required. For more sophisticated productions, you could add a second camera and a special effects generator.

The transmitter broadcasts over the air and can be picked up on home television sets on Channel 7. Though it has a broadcasting range of up to 15 or 20 miles, the actual reception is influenced by changes in terrain, such as hills, escarpments, buildings or dips and valleys in the earth's surface.

The major variable in long distance reception is the location and height of the aerial in the community. For the Trinity experiment the Media Unit operated from the Parish Hall which is situated down in the community. The aerial was on a flag pole about 12 feet off the ground. Reception would have been better on the roof of the hall but rotting stairs prevented the staff from getting to the tower.

Even with an elevation of only twelve to fifteen feet, the signal reached most houses in Trinity. Houses that were down in valleys or behind hills did not receive the signal.

On the other hand, the signal travelled from the back end of the aerial over the water to communities on the other side of the bay. It was received in Trinity East, Dunfield and Freshwater and people reported excellent reception up to four miles away from the point of origination.

INFORMATION OF INTEREST TO THE CANADIAN RADIO TELEVISION CORPORATION

It would seem that, at the moment, the CRTC has no immediate intention to legislate short distance, non-commercial transmissions such as our experiment on Channel 7. However, interest was expressed in the broadcasting potential of small transmitters. Basic information about the set-up was supplied.

Once the transmitter was set up in the community it has a radius from $2\frac{1}{2}$ to 3 miles (over flat land or water it could go to 15 miles). Under ideal conditions the equipment could be set up within an hour. The area used was a galvanized steel construct weighing 45-50 lbs. This aerial (for under \$200.00) that would be equally as effective in conducting the transmission. Two people were required to operate the set-up. The telecast was live, with good color and it would not normally interfere with other transmitters. Sometimes, by a fluke in reception, it could ghost out another channel.

THE SET-UP

In Trinity we mounted the aerial on a flag pole in front of the Parish Hall. We attached a cable to the aerial and ran it in through the window of the hall and attached it to the small transmitter. Another cable from the transmitter went into a videotape deck which could or could not be hooked up to a live camera.

Preparations

In preparation for our experiment, besides collecting the necessary hardware, the following materials were produced:

- 1) A film animation logo of the Extension Service symbol "e" with a music logo to match. This logo was transferred to all the tapes we brought to Trinity for broadcasting.
- 2) A studio color graphic that read 'Channel 7' 'E' Memorial University Extension Service. This graphic was transferred to a one hour tape with 'middle of the road musak' for station interruptions. (The Media Unit later switched music to country and western at the request of our audience.)

The same graphic was used with voice over to explain the nature of the experiment and was played at regular intervals.

The same graphic was also used with voice over for station breaks which said "This is Memorial University Extension Service, Channel 7 in Trinity".

ACTIVITIES AND AUDIENCE RESPONSE

Trinity's Parish Hall became the station site for our experiment. Once an aerial, transmitter and recording/transmitting studio were set up, regular taped programming began. It was decided to include live on-air feeds in order to solicit viewer phone calls and to make arrangements for the taping of local material. An 'Open House' was held for children and adults and three local programmes were then produced, edited, and aired which elicited numerous phone calls from the residents of Trinity.

LOCALLY PRODUCED PROGRAMMES

From the beginning the experiment involved the idea of producing programmes with local people. This intention was announced over the air from the first day of our transmission and

programme contracts were made upon arriving in Trinity. Several local programmes were made which focused on such aspects as the local scenery, children's entertainment, history, sports, and music.

GENERAL AUDIENCE RESPONSE

It took a very short time for people to realize that our channel was available to them, since word spread from home to home and community to community. From the time the station began programming our telephone number was repeatedly aired and the public was able to make live 'on-air' announcements. There was a considerable amount of interaction with them as the crew inquired as to the quality of reception people were receiving in their area. As time went by, people were anxious to discuss the programming and did not hesitate to voice their descriptions of / and requests for local programmes. Some 50-60 calls were made to the station. Many people called to advise us that they were watching Channel 7 and some remarked that they would not turn their dials for fear that they might miss something. Others explained that they enjoyed the 'non-slick' nature of our operation and were happy to see that the station could be operated by "ordinary" people saying "ordinary" things and singing "ordinary" songs. Given the relatively small population in the area and the fact that the farthest distance for any call was approximately four miles away, the author would judge this to be an excellent response. Several callers asked if they could participate in the programming, most enjoyed the music as well as the local content of our programming.

Note on advent screen

It was suggested that the large video screen be set up in a public place so the advent screen was set up in the bar of the local hotel. The screen was in operation for two days and nights and was watched by several of the patrons. From the viewers at the hotel we realized that local

programming was more popular than materials produced outside the community. We also observed Trinity programmes made with local Trinity people were more interesting to viewers than locally produced programmes with 'outsiders'; i.e., government officials residing for a time in the community.

CONCLUSIONS

It is difficult to summarize all that was learned from the Trinity experience. Here is an attempt to highlight some of the more obvious conclusions:

1. It is possible and even relatively easy to set up a television station in rural Newfoundland or Labrador and to broadcast excellent quality signals into local homes.
2. It is possible to attract an audience in a very short time by the novelty of a local origination TV station so that most residents switch to Channel 7 and keep the station tuned for fear of losing out on something new or unexpected.
3. The telephone, in conjunction with the TV station, provides an instant source of communication between broadcasters and audience and has great potential as part of an educational process. People seem to be pretty free in using the phone and talking to people at the station.
4. When it comes to producing local programmes about local people the high interest of viewers far out-strips the need to produce slick television because people don't seem to be able to distinguish between raw footage and edited material. This makes speed in production possible and it makes the television event more immediate.

5. This system of running a TV station in a very informal way helps to demythologize regular broadcast television and it puts local people in a position of suggesting programmes and participating in the actual production. This is what happened in Trinity.
6. People respond extremely well to entertainment, especially music and more serious or educational material can be interwoven with light fare to educate audiences in various content areas.

RECOMMENDATIONS

- 1) That this experiment be studied by members of other sections of Extension and that plans be made to apply its use to various aspects of the adult education process in rural Newfoundland.
- 2) If the Oil and Gas Education Programme or Courses and Conferences should wish to experiment with the technology they should remember the importance of providing audiences with an all around television package which includes fun, music, local participation and educational programming.
- 3) Extension Media should purchase a smaller TV aerial (\$200.00) and some kind of telescopic pole which extends to about 25 feet. The entire station could then be set up in a van which, if the situation warrants, could drive to a new community and set up in thirty minutes. All that is needed is a place to plug in one wire for power.

Charles Callanan is Head of the Extension Media Unit, Memorial University of Newfoundland.

APPENDIX

- a) The Trinity experiment was carefully documented with black and white photographs. These pictures are available from the Media Unit. (50 photos available)
- b) A video documentary outlining the highlights of the experiment is also available at the Media Unit. This documentary contains several of the photos taken in Trinity as well as clips from all the local made programmes.

STEREOPHONIC TELEVISION:
ITS IMPLICATIONS FOR RETENTION AND INVOLVEMENT BY THE VIEWER

Joan Kaller
Temple University
Philadelphia, Pennsylvania

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ABSTRACT

In an attempt to relate stereophonic sound in television to a theory of retention and involvement, this paper reviews the literature pertinent to (1) practical applications for current and potential production uses of stereophonic television, (2) characteristics and theories of monophonic and stereophonic sound, (3) neural functions related to the processing of auditory information based on hemispheric specificity, (4) theories of learning, specifically Cue Summation and Channel Capacity, and (5) measurement and evaluation for retention and involvement with respect to multi-channel media presentations.

In addition to the review of literature, a pilot study investigating the theory that a viewer's retention would increase for a TV program incorporating a stereo soundtrack as compared to one utilizing monophonic soundtrack, is briefly described and preliminary observations discussed.

The conclusions extrapolated from the review of the literature suggest an Optimum Auditory Spatial Stimulus Theory, utilizing interaural time-differences and hemispheric specialization, as a basis for the hypothesis that selectively channeled audio information to left and right ears will yield a positive significant difference in retention and involvement for the television viewer.

A further aim of this paper is to generate an interest among researchers to conduct empirical studies, using reliable biometric measuring instruments, to investigate the relationship of neurological processes to multi-channel programming in television.

INTRODUCTION

Sound, although an integral part of television, has been virtually ignored by empirical researchers. Now with the fast approaching development of stereophonic sound for television, it is hoped that such perpetuation of neglect will diminish and that this paper will act as a stimulus for future research in television sound.

The purpose of this review is to outline the advantages and practical applications that stereophonic sound could have over monophonic sound in television and to relate those advantages in terms of increased retention and involvement for the viewer-listener. Included here is a review of the literature which offers support to the hypothesis that, there will be differences in a viewer's retention and involvement of visual and auditory materials between a monophonic (one-channel) television program and a stereophonic (two-channel) television program.

Stereophonic sound refers to the reproduction of sound through two channels to give spatial information, and monophonic sound refers to the reproduction of sound through one channel. The involvement construct implies a "stimulus that not only captures attention initially but holds it for a sustained period, creating a type of mental interaction with the stimulus on the part of the viewer" (Nasser and McEwan, 1976). Retention will be defined as the recall of visual and auditory messages.

This review of literature shows a number of gaps in the exploration of this field and indicates a strong need for empirical research in the area. Stereophonic television could become an invaluable aid to learning for students through the use of educational and instructional programming, as well as opening up new techniques for dealing with the many special education problems present in our society.

This paper will deal with such specific variables as interaural time-differences and related phase dissimilarities in relation to spatial orientation and listening fatigue in stereophonic sound. In addition, assimilation and processing of audio information will be discussed as a function of perceptual spatial orientation, superior and inferior neural pathways, hemispheric specificity, hemispheric dominance and channel capacity. The final topic, Cue Summation for multiple channel presentations, will be discussed as a correlate of the reviewed literature in terms of retention and involvement.

The primary areas to be discussed in this paper are: (1) a summary of the past, present, and future status of television sound, including practical application for current and potential production uses of stereophonic television; (2) theories of stereophonic hearing and advantages of stereophonic over monophonic sound; (3) research on neural structures and functions that are related to audio processing; (4) the relationship of retention and involvement in reference to the Cue Summation theory and past research pertaining to the TV medium; and (5) implications for retention of dialogue with the use of stereophonic sound for television - a pilot study.

Past, Present, and Future Status of Television Sound

Since the beginning of TV there has been little effort to improve the audio quality of television broadcasting while tremendous technological advancements have continued in the upgrading of the picture quality. This laissez-faire attitude toward television sound has been fostered by the notion that 'the picture speaks' (Skalnik, 1976).

The problem of upgrading audio signals is compounded by the fact that apparently no one is willing to take the first step.

The result has been a vicious circle where the broadcasters refuse to update their system because the receiver is of poor quality and the TV manufacturers refuse to update their receivers because of poor broadcast quality. Les Brown gets to the heart of the dispute when he states that although the technology has been available. "It would have substantially raised the costs of program production and transmission as well as the prices of television sets, without a concomitant increase in advertising" (Brown, 1979).

Robert Liftin, president of Regent Sound Studios in New York City, feels that "the responsibility has to lie with the broadcasters. Once they make an effort to improve the situation, manufacturers will soon follow suit" (Brown, 1979).

Television audio has been monophonic since its origin. It is only recently that stereophonic TV has become a consideration in the U.S., mainly because of the challenging videodisc. The technology for stereo television, specifically the FM-FM multiplexing system, has been in existence in Japan since 1970. "This broadcasting system is feasible to stereophonic broadcasting of television sound or for presenting foreign programs in both the original and dubbed languages. Using this experimental broadcasting (system,) scenes of the opening ceremony of the Japan World Exposition were presented both in English and Japanese" (NHK Handbook, 1970). Today, in Japan, the bilingual multiplex broadcasting system, currently transmitted by NHK, includes newscasts twice a day in Japanese and English as well as popular foreign TV films such as the American detective story Columbo. Stereo programs include concerts by NHK Symphony Orchestra, the year-end Grand Sumo Wrestling Tournament and the annual All Japan Senior High School Baseball Tournament. The Japanese seem to feel that stereo multiplex service is most suited to live broadcasts of music and sports events (Radio Japan News, 1979).

Over a million stereo televisions are sold each year in Japan and they now constitute half the televisions owned in that country (Pro Sound News, 1979).

After ten years the U.S. is finally taking substantial steps towards stereo television. A recent survey for General Telephone and Electronics by Gene Reilly, Group, Inc., revealed an overwhelmingly positive reaction to stereo television, especially for musical specials, concerts, variety and movie programming (Television Digest, 1979). The U.S. could use stereo TV in much the same way as Japan but hopefully would develop the potential for the medium even further. Stereophonic television could be used not only to broadcast two languages simultaneously but to actively teach mono-lingual, restricting much of the populace to deficient cross-cultural knowledge and experiences. Taken a step further, educational programs with narration, most likely demonstrational, could be broadcast with two simultaneous selectable soundtracks on two different levels of difficulty, thereby allowing slower and more advanced students to benefit from the same program.

So far, simulcasting is the closest television has come to improving sound reproduction. Simulcasting is the technique used to give TV programs, usually musical, a stereo soundtrack. This is achieved when a FM radio station transmits a stereo program over the radio simultaneous with the transmission of the video portion of a TV station. The Public Broadcasting System (PBS) has the most sophisticated system for simulcasts called DATE (digital audio for television) (Variety, 1979).

The reason that the television industry is now interested in stereo television is because of the obvious advantages of a two-channel system as well as an increase in public awareness of audio equipment and their demands for faithful sound reproduction.

THEORIES OF STEREOPHONIC HEARING AND ADVANTAGES OF STEREOPHONIC OVER MONOPHONIC SOUND

Just as the effort has been minimal over the years to improve the audio quality of television, even less has been accomplished in empirical research regarding the effects of sound for television. Stereophonic sound in television is fast approaching and the need for empirical investigation in this area should be apparent. If we are to be responsible communicators, it is essential that we understand how to utilize the advantages of stereophonic sound in television as an aid to learning as well as an aesthetic stimulant.

The research up to this time that has been dedicated to hearing, especially binaural hearing, must serve as the departure point for further research into stereophonic sound for television.

Stereophonic sound affords us the opportunity to experience sound in apparently the normal way. That is to say that both ears are not experiencing identical cues as in the monophonic sound that we now hear from television, but rather time and phase-differentiated cues.

Sound entering the ears will differ in relation to the time the signal arrives at each ear. The reason we can identify sound sources positionally is because sound arrives at one ear later than it arrives at the other. This concept is embodied in one of the first theories of stereophonic hearing suggested by Hornbostel and Wertheimer. Hornbostel and Wertheimer's 'time-difference' theory suggests that "sound waves travel through the air, and as such contain periodic peaks and valleys in the same way as any cyclical variation. Since the two human ears are several inches apart, a given sound will travel over two slightly different paths in reaching them. If the lengths of these two paths are not equal, there is a time-difference in the arrival of the sounds at each ear. This occurs whenever the sound source is neither directly behind nor in

front of the listener, that is, neither 0° nor 180° . Thus, the time-differential is nearly always present" (Sunier, 1960). James Moir finds the time-difference to be an average of 0.63 milliseconds between the ears, when the sound source is on either side of the head (Moir, 1959). When we listen to the monophonic sound reproduced from today's television sets, there is little information conveyed about the location of the sound source. The only cues available to us is if the positional relationship is depicted on the screen. Stereophonic sound in television with time-differentiated cues will give us a better representation of depth and spatial characteristics.

Another theory of stereophonic hearing is that of intensity and phase relationships involving positive and negative pressure peaks in a sound wave. "While one ear is receiving a positive pressure peak in the sound wave, the other ear may simultaneously hear a negative peak. Very seldom are both sound pressures at exactly the same point in the cycle as they strike the two eardrums (Sunier, 1960). Phase differences at both ears can be thought of as presenting a time-difference to the nervous system. This theory is also incorporated into stereophonic reproduction when dealing with directional and spatial information. Only two ears can decide the direction of a sound. This is called the binaural effect.

The human hearing system simply cannot receive the necessary psychoacoustical cues and stimuli for natural listening from monophonic or single-channel sound. Due to the fact that identical information is presented to both ears, monophonic sound possesses no spatial or time-differentiated cues. 'Listening fatigue' is also a problem in monophonic sound. This phenomenon is defined by Newitt as "a recognized psychoacoustic effect which eventually makes the listener either subconsciously dislike (and ignore) the music being played or (in more severe cases) compels him to shut off the source" (Newitt, 1953). The naturalness of stereo sound which provides

the necessary psychoacoustical cues, causes the listener, under perfect conditions, to eventually forget that he is listening to recorded sound at all, and the problem of listening fatigue is overcome (Jordan and Cunningham, 1958).

Closely related to listening fatigue, experiments have shown that people prefer listening to monophonic sound at a much lower volume than those listening to stereophonic sound. Again, the reason the subjects are more comfortable listening to a stereo source at higher intensity levels (as much as 20 db) than a monophonic source is that the sound is spread out across the perceptual space of audition rather than being localized to a narrow band directly in front of the listener (Moir, 1959).

It should be apparent by now that it is important to produce a good illusion of realism. J.P. Maxfield of Bell Telephone Laboratories has said: "I would rather hear a two-channel system reproduction good to 6,000 cycles per second than a single-channel reproduction flat to 15,000 cycles per second; it is more pleasing, more realistic and more dramatic (Moir, 1959).

The two theories discussed above encompass the four major factors which make binaural hearing or stereophonic sound possible. They are (1) time of incidence of the sound (time-difference theory), (2) relative intensity (e.g. sound coming from the left will reach the left ear at a higher intensity level than the right ear), (3) phase (time-relationships between two signals or wave forms), and (4) complexity of waveform (Runstein, 1956). The primary advantages of stereophonic over monophonic sound are (1) a better representation of depth and spatial characteristics, (2) more effective tonal and phase relationships, (3) less listening fatigue, (4) the ability to listen at louder volumes, and (5) a more realistic and dramatic effect.

NEURAL STRUCTURES, FUNCTIONS AND HEMISPHERIC SPECIALIZATION IN AUDITION

The primary variables to be discussed here are neural structures and functions that are related to audio processing. Among these are visual and auditory channel capacity, cerebral dominance in audition in relation to neural pathway structures, and hemispheric specialization in audition according to function. The relationship of retention and involvement to these variables will be discussed in reference to the Cue Summation theory as well as past research on retention and involvement in relation to the television medium.

A great deal of information received by our visual and auditory sense organs is disregarded (selective perception) due to the fact that we are only capable of assimilating about 40 to 50 bits of information regardless of how we receive it (Fogel, 1967, Attneave, 1959). Man, as Hsia states, "is capable of processing information through multi-channels so long as the inflow is within the limits of his information processing capacity" (Hsia 1971). The eye, for example, is capable of accepting information at a far greater rate than the brain can assimilate it (Fogel, 1967). The eye, which is mainly equipped for analyzing spatial patterns, is more deficient in short-term memory than the ear which is "better able to recognize time-varying phenomena and therefore has a better retention time for patterns" (Fine et al, 1971). The fact that the ear and its neural processing centers are efficient in recognizing and remembering time-varying phenomena, should lend additional support to the hypothesis that stereophonic as compared to monophonic sound in television will yield a significant difference in retention and involvement due to the increased time-difference cues inherent in stereophonic sound.

Perhaps the major aspect of stereophonic sound so far discussed, is the fact that it provides time-difference cues, that is,

information reaching the right and left ears asynchronously, causing a feeling of depth and spatial orientation. The question that will be discussed here is whether cues presented at different time intervals to the two ears influences detection or learning.

When considering the question of retention in relation to hearing, it is important to consider the audio neural pathways and their termination in the brain. Both ears, while containing identical structures terminate in different areas of the brain.

Kimura, the originator of the ear asymmetry theory, contends that the ear contralateral to the dominant hemisphere of the brain (usually the left) has a distinct advantage over the ear ipsilateral to that hemisphere, for recognition of syllables presented in a dichotic listening experiment with verbal response (Kimura, 1961). He attributes this right-side advantage to the superiority of the contralateral pathways over the ipsilateral pathways as well as the specialization in the left hemisphere for speech. He believed that acoustic stimuli was processed first in the dominant or left hemisphere while information in the right hemisphere had to cross the corpus callosum and be processed secondarily. It was thought that there was an information loss during this time (Kimura, 1967).

Springer, in her two-model experiment, tested Kumura's hypothesis. The results still supported Kumura's hypothesis that a right-side advantage exists but nullified the contention that it was due to the location of the verbal output center in the dominant hemisphere. The second model sought to test the hypothesis that speech processing was carried out in both hemispheres but that verbal output is a function of the left hemisphere. Since there was still a right-side advantage for a nonverbal response, the idea that speech processing is carried out in both hemispheres was nullified. These data confirm that the brain is asymmetrical

in relation to speech processing and verbal output. The degradation of information is therefore still a factor for the left ear. It also supports the fact that "the ear asymmetry phenomenon is at least partially perceptual in nature" (Springer, 1971).

Results of a study by Morais and Bertelson (1975) indicate that spatial relation, not ear of entry, is the factor responsible for auditory laterality. The significance of these results is that informational content of an auditory stimulus will initiate activity in one cerebral hemisphere which in turn shifts attention to the contralateral side of space. This explanation of auditory asymmetry is not inconsistent with Kimura's contention that superior pathways for the right ear exist in speech processing. Rather, this position merely enlarges the theory to say that for functions of the brain related to auditory stimuli, there exists neurological pathways to both the left and right hemisphere. The superior pathway, however, is determined by which hemisphere is responsible for processing the specific audio stimulation.

This contention is supported explicitly in a study by Safer and Leventhal (1977) in which subjects were presented with verbal passages that consisted of three levels of tone of voice (positive, neutral and negative) crossed with three similar levels of content or meaning. The results indicated that a majority of the subjects who listened with the left ear used the tone of voice cues while those who listened with the right ear used the content cues. This outcome is totally consistent with the idea that each hemisphere of the brain is specific for certain functions and that neurological pathways to the hemisphere involved in processing specific information will be superior for the ear that is contralateral.

In a second experiment, Safer and Leventhal (1977) found that the hemispheric dominance displayed in the first experiment could be interrupted by placing a task demand on the subjects. The explanation for this effect was that the task itself induced its own hemispheric dominance.

CUE SUMMATION THEORY IN RELATION TO RETENTION AND INVOLVEMENT

Past research pertaining to the effects of different media upon recognition learning (retention or recall) have used the Cue Summation theory as a basis for their foundation. Cue Summation theory essentially states "that learning of discriminations is increased as the number of available cues or stimuli is increased" (Hartman, 1961).

Frank Hartman suggests that there is evidence to support the Cue Summation principle in relation to multiple-channel media presentations and supplied strong support for his two hypotheses that predicted significant differences "in amounts of learning when information is presented over single and multiple communication channels" (Hartman, 1961).

Stereophonic sound with its increased number of cues over monophonic sound would offer more information to the viewer and would therefore fall within the constructs of Cue Summation theory. The idea that more cues result in better learning, however, is too simplistic a statement. The results of Hartman's experiments indicate a number of variables which must be taken into account when testing for Cue Summation. All these variables determine whether additional cues from additional channels will have a summation or an interference effect.

It has been shown in prior research that there is a general public preference for multi-channel media over single-channel media.

This was shown by Weiss who states that the general public preferred TV over other media as an information source and emphasized its visual and live qualities (Weiss, 1971). This data could suggest that more involvement is induced by television than for other media. If involvement is positively correlated to recall, then television should yield a higher degree of recall than other media for the same material.

It is important here to determine the prerequisites for involvement as well as determining a yardstick by which it can be measured. Generally speaking a hierarchy of factors contribute to the concept of involvement. The initial phase of involvement can be thought of as a function of the complexity or novelty of a stimulus followed by an increase in attention, followed by arousal which is a positive correlate of involvement (Berlyne, 1960).

Krugman measured involvement in terms of brain wave activity (Krugman, 1971). His findings showed a higher incidence of alpha waves indicating a passive state and less involvement for television than for other media. The results, however, are inconclusive due to the small sample (one subject) and lack of rigid controls.

In an experiment by Nasser and McEwen (1976) involving presentations of print, audio and videotape, the authors hypothesized that "a summation of cues in the bimodal presentations would cause higher recall of a message as well as greater involvement". Although there was a higher incidence of recall for multi-channel presentations, there was no concomitant increase in involvement. In other words, learning can take place in the absence of involvement. One must keep in mind, however, that Nasser and McEwen's measurement used to ascertain degree of involvement (written response of felt involvement) as well as the experimental design itself may have "artificially created a negative recall involvement effect".

The fact that no increased involvement was attributed to additional cues in the bimodal presentations of this study may place doubt on the involvement theory but can hardly invalidate it. Major factors such as the black and white format and lack of production techniques may have heavily biased the results. It seems reasonable to assume that studies carried out in color with full TV

production capabilities would result in a higher level of attention and possibly involvement.

IMPLICATIONS FOR RETENTION OF DIALOGUE WITH USE OF STEREOPHONIC TELEVISION - A PILOT STUDY

A small pilot study was undertaken in order to pretest the questionnaire, determine proper procedural methods, and raise unanticipated problems in the testing situation.

The two problems being investigated were: (1) Will retention of auditory materials in television (dialogue, specifically) be more significant when presented stereophonically as opposed to monophonically? and (2) Will retention of auditory materials in television (dialogue, specifically) be more pronounced when presented stereophonically on the right or when presented stereophonically on the left?

Forty-four subjects were divided into two groups. There were 22 male and 22 female subjects. The distribution of males and females between the two groups were equal and random. Each subject saw the identical video program, however, one group heard the sound in stereo while the other group heard the sound monophonically. Twenty-two presentations were run with two subjects present for each viewing. Subjects were seated six feet from the monitor with loudspeakers positioned at 45° on each side of the medium plane. After each presentation, subjects were given a questionnaire totaling 50 questions pertaining to specific aspects of audio and visual content. The questions related to the audio were subdivided into left, center and right categories for later evaluation. The questions were multiple choice and only one answer was correct. Subjects were graded for correct answers.

A t-test was done using the data gathered from 39 subjects.

Five questionnaires had to be discarded but male to female ratio still remained relatively equal between the two groups (Mono Group - 10F, 9M and Stereo Group - 10F, 10M).

No significant difference in retention was found between the stereo and mono groups. However, this preliminary study was implemented primarily to observe the test situation and clarify procedural methods in order to make needed revisions for future experimentation. Numerous factors are believed to be responsible for the lack of significance, however, the primary deficiency is thought to be the small sample. Indications in the raw data moderately suggest that retention is more pronounced when auditory information (dialogue) is presented on the left.

Observations and results of this study revealed certain problems requiring changes in procedural methods for the final experiment. Correlations of data based on the questions disclosed that several were unsuitable or non-functional and were hence deleted. It was also found that subjects reported confusion because of the largeness of the testing room which resulted in exaggerated ambience of the audio. The experimental environment would probably be best suited to a simulated living room area, which is perhaps the most common viewing room. Also, to insure exact stereo center, the experiment should be conducted using only one subject per viewing. A final consideration of the study was the use of earphones to further enhance the stereophonic reproduction of the soundtrack, while eliminating extraneous audio distractions.

Although no significance was found in the pilot study, it is not necessarily an indication of an invalid theory but perhaps only of a yet rudimentary experimental design. A larger sample and the procedural changes mentioned above should facilitate more accurate and valid results.

CONCLUSION

Stereophonic sound possesses many advantages over monophonic sound primarily in terms of spatial relationships and ease of listening. This is a result of an increased amount of information available in the form of time-differentiated cues. These time-differences serve to localize information somewhere in space, either in the center or to the left or right.

One of the suggested conclusions of this paper is that this perceptual localization of auditory stimuli, based on interaural time-differences can be the basis for an Optimum Auditory Spatial Stimulus Theory relative to hemispheric specialization. It has been shown that the left and right hemispheres of the brain are specific for certain functions and that there is an advantage for the ear contralateral to the involved hemisphere. The hypothesis, in accordance with this theory, could suggest that since for specific functions there exist side advantages due to superior auditory contralateral pathways, material could be selectively channeled to the ear possessing the superior pathway to the processing center related to that material.

The material that is channeled to the ears must, however, be extremely controlled. Investigations into the Cue Summation Theory which states that additional cues lead to better discrimination learning, has warned that interference may result if cues from different channels are of a conflicting nature. Such cue variables to be controlled for are similarity, complexity and relevancy of content, speed of presentation and testing conditions. Compliance with regard to regulating these cues, as long as they do not surpass channel capacity, should result in an increase in retention and possibly involvement. Verbal or written response of involvement may be misleading due to subjective interpretation of felt involvement and possibly experimental design. It seems that physiological

measurements through EEG's, Computer Based Eye View Monitors with EYE TV Television Stimulus Presentation and Processing Systems, and perhaps even electrical impulse readouts from the Reticular Activating System (responsible for arousal functions) would be a more valid method for evaluating the degree of involvement in reference to stereophonic television. Programming, used as a stimulus associated with involvement, is another shortcoming of TV research. Instead of static non-production type of stimuli commonly used to test for involvement, future research must include conventional television formats with everyday production elements that we are accustomed to seeing, in order to evaluate involvement for this medium.

The preceding review of literature has dealt primarily with theories of perception, physiology and neurology, outlining the variables associated with the assimilation of audio information in an attempt to relate retention and involvement to presentations of stereophonic television. Limited experimentation that is common to these different theories raise crucial questions with regard to the role of stereophonic sound in television.

Research questions generated from the hypothesis of this paper that might be investigated are: 1) how does stereophonic television correlate to involvement using reliable means of measurement? and 2) how is learning affected by selectively channeling information to left and right ears? The combination of stereophonic sound with TV visuals in relation to the asymmetry phenomenon of both ear and eye, also poses a question: how will placement of audio information in the right and left channels affect visual elements placed on the right or left side of the screen?

It has been shown that media stimulus learning, such as television, due to its complexity, requires research encompassing other disciplines outside of communication such as physiology, neurology, and psychology. Unless there is a comprehensive effort

on the part of empirical researchers to combine these modes of research into meaningful and valid studies, stereophonic television, the child of the eighties, will always remain an infant born to irrelevancy and controlled by the whims of advertisers and commercial television.

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Joan Kaller is a Master of Fine Arts candidate in the Radio-Television-Film Department of Temple University, Philadelphia, Pennsylvania.

PRACTITIONERS' SUMMARY

Donald Ferguson
Garfield Fizzard

Sabine Jorg

CBC, Toronto

Memorial University
of Newfoundland

Bayerischer Rundfunk
Germany

PRACTITIONER'S SUMMARY

Dr. Fizzard: Instead of having a panel and a discussion per se, each of us will give our reactions to the Conference and make some comments, and there may be a few minutes for discussion afterwards. To open the session, I am pleased to introduce Don Ferguson who most of you, I expect, have met during the Conference. Don is the Assistant Director of News and Current Affairs with the CBC (Toronto).

D. Ferguson: For those who don't know what the CBC is (for people from abroad) the CBC is the nearest thing you will find in North America to a European-type broadcasting institution. We're somewhere between PBS North and CBS North, I suppose, with many of the characteristics of a commercial broadcasting network but also with a very clear sense of the social function of broadcasting, the role of news information, of what we broadly call reality programming. I am, myself, a journalist. I've spent my whole career in journalism and come to television therefore not as a dealer in production values and camera angles so much as someone essentially concerned with content and message with what the people need to know about and how we can best arrange, gather, collect and render accessible that content material.

The reason I thought this conference a good idea and came in the first place was the way in which it seems to me to bring together two disciplines, my discipline as a journalist and the discipline of many of you as educators. We face daily many similar problems-problems that very few of us, I would suggest, have much understanding how to solve. We are equally (both sides of the house) committed to the proposition that what we are trying to do is worthwhile and is worthy of a lot of hard work serious attention, thought, expense, money, and labour. We believe that it is and it should be possible for television to attract large numbers of people, to convey to them facts, information, impressions, and understandings, with enough force, emphasis and interest that they might stay in the mind for a little while at least,

thereby fulfilling the original basic roles of journalism in society.

God knows we've got problems, we've got enormous problems, we don't really know what we are doing. I think maybe you have a better idea in education as to what you are doing than we have in journalism. We are for the most part groping in the dark. Most of the people in television news come from journalism. They don't come from the theatre with an understanding of the stage, of angle shots and dramatic impressions, but from the discipline of information. The knowledge that we are groping in the dark is constantly with us. The producer in the control room of a news program, the assignment editor, the lineup editor labours constantly under the shadow of the typical viewer who he has fixed in his mind. That is a guy needing a shave with a beer can in his hand who half a dozen times in the course of a news program turns to his wife and says: "What the hell did he say?" or "What's that all about?" We lose them. We know we lose them. Our tests show that the number of people who even immediately after a program can recall what was said is small. By next morning viewers don't even know what was in the program. Yet we know also from tests that this doesn't apply with the printed word. People who take the trouble to sit down and read a newspaper have a much hotter connection. A much stronger communication is established.

So why should we worry? I'll tell you. Because society has chosen to regard television as the new journalism. Every study published proves again and again that most people, when asked where they get their news from, will reply quickly and with complete confidence "from television". And yet there is no evidence to suggest that TV news is really working. A lesser number of newspapers in comparable markets is published now than twenty-five years ago, and although circulation is maintained more or less with population growth, it is certainly true that

the amount of time people hold a newspaper in their hand (the amount of communication the newspaper is generating in society nowadays) declines and declines rapidly. And we find ourselves in television journalism required to pick up the slack. It is a commonplace that people in large numbers, academics particularly at times, point accusatory fingers at television journalism as a force for obscuring the public interest, for confusing. And, God knows we do that. It's never our intention. It's perhaps a result of not knowing what we are doing and of not understanding the vocabulary and the syntax which we have to use every day.

Our problems are more severe than those most of you have in education because, in general, television as a means of education is not threatening the classroom. There is no danger that children are going to stop going to school and stay home to watch television instead and call that education. What you're trying to do is to open new directions, improve techniques and so forth. And of course that's all to the good. Although you are not sailing forward with the wind of social necessity at the back of your neck as we feel we are in journalism, we do have the problems of learning how to use the medium in common with each other.

In 25 years of TV journalism I would say we've not come very far. The mistakes we make today are, I'm sure, small compared to the mistakes we made 25 years after Gutenberg invented his amazing machine. We are in the infancy of the medium and are struggling to move ahead. The truth is that the comparison is generally made between what newspapers used to be like and what people therefore assume television should be like. There is very little tendency in society to face the real differences between them. A television news program is required to be something like the Christian Science Monitor, the New York Times, the Globe and Mail and the Financial Post all in $12\frac{1}{2}$ minutes. The New York Times is capable of producing a hundred pages, but any television news program is the equivalent of one quarter

of a single page. The selection, the choices, and the difficulties involved are to be measured in that ratio. We get, at the same time, the awful problem of a lack of stratification. The television program is supposed to be seen by the whole of society. The whole community is assumed to watch, whereas with newspapers you have between one and a dozen to choose from in some cities, and more still if you include the periodicals. A television news program, is supposed to be all things to all people. So we look to you, the academics and researchers, for a lot of help.

I think we're getting some. And I think there's been a lot of help offered here in the last three days. I'm very glad I came and I think it's wonderfully virtuous of Memorial University to have established this study. I'm very glad to have listened to Deane Hutton describing his tacit 'bicycle ride' because, God knows, we do that daily. I think that Keith Mielke has succeeded in producing an excellent television program (3-2-1 Contact) with more research than Ford put into the Edsel and with a different result. I think we also need to be grateful for the assurance that science is not likely to produce a ten foot ant, which I found a great comfort! Erhard Heidt sobered us all by saying, "Well, research isn't going to help us very much"; but he was quickly followed by a lot of people, who, to me, seemed to be suggesting otherwise. A lot of speakers dug into the vocabulary and syntax of our new visual language in a way which I think holds promise for a lot of help in the production of news programs - Claudette Davis, for instance, looking at what the language of film cutting really means. Heaven knows, someone with eight minutes to cut a 90 second piece before a news deadline needs that kind of help.

Charles Callanan made the point that nothing works like local identification. We've always suspected this in news, whenever we face the constant problem of creating a balance between, for instance, a fire on Main Street and trouble in Afghanistan. We need in T7 news to learn a lot about these experiments in

local broadcasting--'narrowcasting' as it is nowadays called.

The lecture by Nikos Metallinos brought us back to what you might call 'eternal verities'. The new program is art. This is a concept that is not often found in the newsroom. Maybe it should be to a greater extent. We are after all putting a picture into people's front rooms which will be judged at the very least as a picture. Dolf Zillmann had a lot to say about humor and I think there is relevance for us there too. It is a custom in news to try and get a light story in here and there. People do this because it has always been done. Do they really know what they are doing? What kind of humor? Should that humor be related to the day's events or not? These are problems which I'm sure many journalists would like to see Dolf address--bringing news as well as the education of young persons into his considerations.

Three speakers (Jon Baggaley, Gary Coldevin, and Jim Paluzzi) gave papers which contained nuggets of pure gold from the newsman's point of view. How to actually manage oneself in the studio. They didn't say anything about content (content is another matter) but they stressed how to make the mechanics work to get the effect you are after; this is something we need to know about badly. George Spears pointed out a way in which we have the opportunity to get better measurements of what we are doing. His PEAC System is a very promising tool. I would be very surprised if more people in newscasting were not to take it up and examine its relevance to what we do.

So we worked through all these areas, when along came Herbert Down with a new medium (Telidon) which will throw the whole thing out the window and require a complete new set of researchers, assumptions and techniques for the study of printed word news on television. That obviously is a new medium requiring an entirely fresh understanding and philosophy unlike newspapers, unlike television broadcasting. And it isn't as if this is

a 100 years away; it's just around the corner. So whether one takes pleasure or dismay from such new developments is immaterial: we are going to have to face it because it is going to happen.

Where do we go in future? I think I'd just like to leave you with this thought--that is the really positive, up feeling that I take away from the past three days shows that this conference has represented a process of bridge building. We in the TV news profession must now get much closer to you in research and in the Universities to see if together we can work out some answers, some tentative directions in what is right now a total mess.

Dr. Fizzard:.....Sabine Jorg, I think, represents that bridge-building process. I suspect she would consider herself a researcher with links to practitioners or producers in the field. Sabine is from the Bavarian Broadcasting Corporation and is attached to an Institute within that Corporation which does research, for the benefit of its producers.

Dr. Jorg:.....The first thing I have to do is to apologize for my English. I would be glad if I only had a bad accent. But sometimes I come up with things quite different from what I intend to say. For instance last night I wanted to ask my teasing dinner companion if he was making fun of me. What I came up saying was "Do you want to make fun with me?" So, perhaps you can imagine that I feel quite often misunderstood. And I have much empathy with producers when their program is reacted to in quite a different way than they intended it to ---which is the problem of communication that we are working and thinking about.

For my part I enjoyed the communication of this Conference very much and I think that quite a lot of ideas have been transmitted,

transferred to one another, to all of us. And I dare not go over all these different pieces of information again. One reason for this is so that I will not make the tacit knowledge I've got from, for instance, Deane Hutton explicit and perhaps lose it by this.

So let me give please a personal and selective impression of what I got out of this meeting. The discussion just five minutes ago came up with the relation between the producers and the researchers. James Paluzzi has alluded to it and I think various people regard it as central to the Conference. The question is: what kind of a bond is there between these two sides of the problem? We are all in one boat, but we are on different sides of the boat. I should like to look at this cooperation starting from what we heard about visual literacy, about viewers' habits of perception, and about the processes and effects of the media.

Perhaps there is in any partnership some disappointment, now and then on both sides, perhaps some misunderstanding. And at times one may question whether one's partner serves any useful purpose. I would suggest that the bond between researchers and the producers is an awkward bond still, except perhaps in formative research. Sometimes, the researchers try to please the producers by way of over-simplification - by making things look neater than they really are, or even by saying that research has nothing to say. I think that even this is a big step forward compared with the time when researchers said "We have the answers - what are your questions?" But there is still some insecurity on the research side and perhaps also on the other side of the partnership. Some producers like to look only at those types of research which prove nothing but which are already established. And they tell you that these investigated questions are irrelevant, that they already know the results. In Germany we have a rhyme - unfortunately there is no nice translation - which says that if you marry at a young age you will never regret

it. But there is another proverb which says that if you are tied to only one person examine over and over again, and perhaps there will be a better choice for you. As you can see, these are both common sense assertions telling quite different things.

What I wish to say is there is a lot of research which at the first glance perhaps seems to be trivial but which may provide some counter-intuitive results as Dolf Zillmann showed us - results which may nonetheless prove to be right and lawful. Our own intuition is not always the best adviser. We are perceiving wishfully sometimes, and always according to our own personal backgrounds. So I think we must give ourselves a chance to check out our perceptions and how we are doing against scientific knowledge. I won't claim that we should trust in all scientific results. As we realize - and as some English poet, I think, said - "Facts are like cows: if you look them in their eyes they run away." We shouldn't be depressed by this I think. At least we can try to get hold of one fact or another and to test it out.

That is what I wanted to say about the human problems of making the TV software. Another main aspect of the Conference was what we were told about hardware, new technologies, audio-visual instruments, stereophonic listening and such things. I must say that I was very impressed by what the computers already can perform, and it showed me how middle-aged we are on the other side of the Ocean, at least in West Germany. I was really amazed with all these things and a little bit troubled also. So, on the whole, my remembrance of this conference will be an amazing, humorous, professional and sophisticated audio-visual one. Thank you very much for being here.

Dr. Fizzard:...I too have trouble in trying to summarize or to arrive at some kind of cohesive feel for the conference. I've got a feeling that it's like trying to get a paper bag and

catch some Newfoundland fog. You never quite know when you've got it. And I think that's where I am right now. I also think that it would probably be presumptuous of me to say what the Conference meant, because we are clearly all taking away something quite different from everybody else. For we come from such a wide range of backgrounds - theoreticians, researchers, producers and in some cases consumers who are simply interested in finding out a little more about what's happening with this strange medium.

In any event I'll make a few comments, very random. One thing seems pretty clear, and it reinforces perhaps common sense: that in the production and the receiving of a television program there is a wide variety of factors that come into play. In some cases these arise in the technology itself and in some cases in the minds of the individuals watching. It is also pretty clear that we have simply started to scratch the surface, and perhaps not even made much of a scratch at the understanding of these factors. This should not be very depressing or surprising considering that television is a pretty new medium. If I may, I'd like to suggest a hint to the researchers who have presented here at this Conference. I don't think that we should be ashamed or reluctant to admit that we are in fact simply probing and asking questions and coming up with very tentative guesses, educated guesses, or hints; we shouldn't feel the need to take a dogmatic position especially on every micro-element of this whole phenomenon. I suspect that, perhaps indirectly, television itself may be getting us into the notion that we have to appear very confident all the time, that we know what we are about. And this may be carrying over into our Conference presentations. I think it is much more becoming to admit that we are, in fact, very uncertain. I think the whole notion of suspended judgement is much better than the adoption of a dogmatic position in public which gets you into a debating society.

I would suggest to the Conference organizers that, for certain elements of any follow-up Conference, a symposium model might be followed rather than a presentation model. I think it might encourage the genuine exchange in a non-combat mode. Its clear to me too that given the current lack of firm knowledge and predictive theory, producers are still left to act on intuition although it may in fact be erroneous. I think it is probably as important for the producers to know what is not known as to know what is known. Ignorance is never blissful at least in this regard. But it's nice to know where the parameters of knowledge are. And perhaps this aspect of the Conference has been comforting to some of the practitioners present - that the cutting edges are now known to you. I suppose it's fair to say that the perfect communication system or act is one in which intuition and experience all come together on both sides of the medium. They come together with the desired result. At present we suspect that when most successful communication occurs it is as much by chance as by design. And it's perhaps lucky and surprising that it is successful as often as it is. We have also been made aware of the fact that very often one little element can be dysfunctional and override all of the others. You pull it out and it destroys everything else.

I am reminded, for example, of last Saturday evening. I sat down alone to watch the CBC National News. My wife and two teenage daughters were somewhere else in the house. As soon as the TV news came on, it was apparent that Jan Tennant had a new hairstyle. It took me perhaps one-tenth of a second to recognize that, and I suppose I attended to it for maybe four or five seconds. But I was curious as to what would happen when the female members of the family came in. Of course, immediately one of them saw it and called out to the others, "Come and see Jan Tennant - she's got a new hairstyle." And for the next five minutes there was a detailed discussion about whether

it was a good hairstyle or a poor hairstyle. Don (Ferguson), you'll be glad to know the vote was 2 to 1 in favour. I'm not sure yet whether the hairstyle was functional or dysfunctional, I don't know. I know I missed the first two stories in the newcast until I was reminded that I had a social obligation to be informed!

It seems to me that one of the sources of difficulty in this whole business of investigating television is that we are using scientific or pseudo-scientific devices sometimes to investigate a medium which has certain artistic elements. And that is obviously a problem for us. My suspicion is that in television the whole is more than the sum of the parts, and that this causes a very considerable problem for those who are trying to vivisect it and to get at the micro-elements. One of the things that wasn't addressed very much at the Conference was the effect that television has on the self-concept of people. The identification of the image with the individual. This is not, I think, simply a problem with television. I contend that it has to do with the effects of schooling, textbooks, etc. on the self-concept especially of minority groups. In some ways Newfoundlanders are a minority in the North American context and certainly in the world context. I'm interested in what television is doing to this type of self-concept when the audience sees models of people from other cultures. Putting somebody on television or writing about them in a book gives them an importance over and above those who do not achieve that kind of notoriety. What happens if you never get on television? Are you then of a lesser breed? That is becoming a problem for Newfoundlanders. The old generation of Newfoundlanders had a much better concept of who they were.

I'm reminded of a story of a resident of New York who came to the small Newfoundland community of Belloram, an isolated community in Fortune Bay. If any of you are from New York or know New Yorkers, you know that the world does not start

for a New Yorker until he has read his New York Times each morning. So to the man who wanted to get away from it all - when he got to Belloram, isolated with no New York Times, uncertain radio and television, totally isolated - for the first little while it was great, but then he began to miss his New York Times. He was no longer part of the world, and he began to get very uneasy. He was suffering from withdrawal symptoms. One morning he went down to the wharf and saw old Uncle Bill waiting for the boats to come in with the daily fish. He said to Uncle Bill, "You know, I don't know how you survive here. Look at all the important things that are happening in New York - 8-10 million people - all kinds of important things going on - the United Nations and the Trade Fairs and the Stock Markets. Here we are not knowing anything about what's going on there." Uncle Bill sort of sucked on his pipe and looked out over the stagehead a bit and said, "Yeah, you're right, but they don't know what's going on here either." He knew where he was. But I think we are now beginning to get just a bi' more uncertain than this as to where we are.

In closing, I've looked upon this Conference as a kind of a communication device. I am also a firm believer that the physical environment sends out all kinds of messages. I have a lot of problems with this particular room as an environment for a Conference of this nature. I have been moving around on the platform deliberately. In fact, I went right to the edge of the two sides of the room to see what effect it would have. Could I hear? Could I see? Jon Baggaley may believe it is better to have side views than front-on shots on television, but it sure doesn't work in this room! As I sat in the audience I was bothered with this protrait hanging behind the lectern. Part of the problem is that I know the gentlemen in the portrait - Dr. A.C Hunter - from experience.

Dr. Hunter came to Memorial in the 1920's. He was here when I was here as an Undergraduate. He was a fine old English scholar and gentleman with a very humane approach to life. He was very scholarly. He taught me 17th Century French and we were pretty sure he dreamed in it. I should add that he was also a very hard master. I would cringe, we all cringed in our seats for he stared at us just like in the portrait.

You should have seen him when he was angry. But, interestingly enough, he did not ignore modern technologies. I don't think he used television, but he certainly used still pictures. His pictures of the wildlife and wild flowers and communities of Newfoundland are magnificent. He also used to go on radio every Sunday morning and preach to us colonials about the virtues of culture. I don't mean to be nasty - in fact it was exceptional. As I sat at the Conference I wondered: What Dr. Hunter would say if he was here today. I suspect he'd probably say something about.....

Dr. Hunter (disembodied): Let me speak for myself please. I have observed your Conference and wish to make a few comments upon it. I believe it is appropriate to investigate, probe, and reflect on the unique features of television and on the ways humans interpret messages through it. You are, of course, aware that evil people may use your knowledge for evil purposes. But that is true for almost all knowledge. And that's another story. Remember this: at its best television communication, as indeed all communication, is mind touching mind; spirit touching spirit. I wish you well.

Dr. Fizzard: Thank you, Dr. Hunter. I couldn't have said it better myself.

Dr. Hunter: I know!

Donald Ferguson is Assistant Director of TV News and Current Affairs at the CBC in Toronto.

Dr. Sabine Jorg is a member of the Research Department of Bayerischer Rundfunk, Germany.

Dr. Garfield Fizzard is the Director of the Division of Learning Resources at Memorial University.

Dr. A.C. Hunter (deceased) was Vice-President of Memorial University College (1933-1949), Head of the English and French Departments as well as Dean of Arts and Sciences at Memorial University until he retired in 1957.

LIST OF CONFERENCE PARTICIPANTS

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(* denotes speakers)

*ALDRICH, Dr. Fred	Graduate Studies Memorial University of Newfoundland St. John's, Newfoundland
*BAGGALEY, Dr. Jon	Institute for Research in Human Abilities Memorial University of Newfoundland St. John's, Newfoundland
BLOM, Bob	CBC Halifax, Nova Scotia
BOORSMA, Dr. S.P.	Ped. Did. Institute University of Amsterdam The Netherlands
BOUZANE, Mrs. Lillian	CBC St. John's, Newfoundland
*BOWN, Herbert G.	Communications Research Centre Government of Canada Ottawa, Ontario
BRADBURY, Miss Heather	University of New Brunswick Fredericton, New Brunswick
BRAFFET, Dr. Richard	Division of Learning Resources Memorial University of Newfoundland St. John's, Newfoundland
BROMLEY, Father Edward T.	Diocese of Grand Falls Bonavista, Newfoundland
BROWN, James	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
BUTTERS, Brenda	CBC-TV St. John's, Newfoundland
*CALLANAN, Charles	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
CARL, Dr. Diana	Medical TV Department St. Clare's Mercy Hospital St. John's, Newfoundland

COADY, Ed	CBC-TV St. John's, Newfoundland
*COLDEVIN, Dr. Gary	Department of Education Concordia University Montreal
COOPER, Debra	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
*DAVIS, Mrs. Claudette	Department of Education University of Cambridge England
DAVIS, Herb	CBC-TV St. John's, Newfoundland
DOHERTY, Hugh	CBC-TV St. John's, Newfoundland
DOUCET, Edwin	Universite Sainte Anne Digby County, Nova Scotia
*FERGUSON, Donald	CBC-TV Toronto, Ontario
*FIZZARD, Dr. Garfield	Division of Learning Resources Memorial University of Newfoundland St. John's, Newfoundland
FOUILLARD, Anne	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
GRANT, Mrs. Ginny	Junior Studies Psychology Memorial University of Newfoundland St. John's, Newfoundland
GREENING, Fred	CBC-TV St. John's, Newfoundland
*HEIDT, Dr. Erhard	University of Bielefeld West Germany
HOLLETT, Lorne	NTV St. John's, Newfoundland
*HOLLINGSHURST, Fred	ETV Memorial University of Newfoundland St. John's, Newfoundland

* HUTTON, Dr. Deane	Salisbury College of Advanced Education Australia
JAMIESON, Dr. G. Harry	Centre for Communication Studies University of Liverpool England
JONES, Dr. Pauline	Institute for Research in Human Abilities Memorial University of Newfoundland St. John's, Newfoundland
* JORG, Dr. Sabine	Bayerischer Rundfunk Germany
* KALLER, Miss Joan	Department of Radio - TV - Film Temple University Philadelphia, Pennsylvania
LAWRENCE, David	NTV St. John's, Newfoundland
LEE, George	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
MADDIGAN, Richard	Junior Studies Psychology Memorial University of Newfoundland St. John's, Newfoundland
MANDVILLE, Malachy	Part-time Studies Memorial University of Newfoundland St. John's, Newfoundland
MARET, Fred	CBC-TV St. John's, Newfoundland
MATHEW, Dr. David	Educational Broadcasting Council BBC London, England
* METALLINOS, Dr. Nikos	Department of Communication Studies Concordia University Montreal
* MIELKE, Dr. Keith	Children's Television Workshop New York
MORRIS, David Paul	University of Calgary Calgary, Alberta
NEWHOOK, Shirley	CBC-TV St. John's, Newfoundland

NORMAN, Kevin	CBC-TV St. John's, Newfoundland
NOSEWORTHY, Cathryn	Junior Studies Psychology Memorial University of Newfoundland St. John's, Newfoundland
O'DEA, Noel	School of Business Memorial University of Newfoundland St. John's, Newfoundland
*PALUZZI, James	School of Speech Kent State University Ohio
PAUL, Don	NTV St. John's, Newfoundland
PETRIE, Robert	Arts & Culture Centre St. John's, Newfoundland
REID, Janet	Memorial University of Newfoundland St. John's, Newfoundland
RIGGS, Ronald	Greenville Technical College South Carolina
RODENBURG, Dr. N.	Teleac TV Utrecht, Netherlands
SCOTT, Dr. John	Presidential Cable TV Committee Memorial University of Newfoundland, St. John's, Newfoundland
SEVENHECK, Dr. A.J.J.	Teleac TV Utrecht, Netherlands
SINCLAIR, Professor Philip	University of Toledo Ohio
SMITH, Kirk	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
*SPEARS, George	Office of Project Research PEAC Developments Toronto, Ontario
STIRLING, Geoffrey	NTV St. John's, Newfoundland
STIRLING, G. Scott	NTV St. John's, Newfoundland

SULLIVAN, Dr. Arthur M.	Extension Service Memorial University of Newfoundland St. John's, Newfoundland
SUMMERS, Mrs. Mary	Portugal Cove Newfoundland
TROCMÉ, Dr. Helene	Institute Universitaire de Technologic La Rochelle, France
VERHAGEN, Plon W.	Onderwijs Research Centrum Katholieke Hogeschool Tilburg, Netherlands
WICKS, Rene	Medical TV Department St. Clare's Mercy Hospital St. John's, Newfoundland
*ZILLMANN, Dr. Dolf	Institute for Communication Research Indiana University Indiana